Dictionary of Fallacies

INDEX

A

Appeal to/
Argument from...

Argumentum ad...

Quoting Out of Context

Alias:

- Abstraction
- Accent (not to be confused with Aristotle's fallacy of Accent)

Type: Ambiguity

Quote…

"Text, without context, is pretext.**…**"

Source: Jesse Jackson, quoted in Sheldon R. Gawiser & G. Evans Witt, *A Journalist's Guide to Public Opinion Polls* (1994), p. 111

Context of the Quote

Example:

Have the various fossil candidates for a place in our human ancestry stood the test of time?

Answer: One by one, various fossil man finds have flashed across the front pages of the newspapers and been the subject of many scientific studies and reports, only to be at last either discredited or just forgotten, replaced by newer finds which also eventually fade away. In 1981 British scientist John Reader commented on this Hollywood character of some of our former alleged ancestors:

"Not many (if any) [fossil hominids] have held the stage for long; by now laymen could be forgiven for regarding each new arrival as no less ephemeral than the weather forecast.…"

Source: Robert Kofahl, *Handy Dandy Evolution Refuter*, Chapter 8, Question 4.

Context of the Example

Exposition:

To quote out of context is to remove a passage from its surrounding matter in such a way as to distort its meaning. The context in which a passage occurs always contributes to its meaning, and the shorter the passage the larger the contribution. For this reason, the quoter must always be careful to quote enough of the context not to misrepresent the meaning of the quote. Of course, in some sense, all quotation is out of context, but by a "contextomy", I refer only to those quotes whose meaning is changed by a loss of context. The *fallacy* of Quoting Out of Context is committed when a contextomy is offered as evidence in an argument. Such fallacious quoting can take two distinct forms:

1. **Straw Man**: This form is especially common in political debates, when an opponent is quoted out of context in order to misrepresent the opponent's position, thus making it easier to refute. Frequently, the loss of context makes the opponent sound simplistic or extreme.
2. **Appeal to Authority**: Naturally enough, arguments from authority often quote the authority as a premise. However, it is possible to quote even legitimate authorities out of context so as to misrepresent the expert's opinion, which is a form of misleading appeal to authority.

Source:

S. Morris Engel, *Fallacies and Pitfalls of Language: The Language Trap* (Dover, 1994), pp. 27-30.

Resource:

S. Morris Engel, *With Good Reason: An Introduction to Informal Fallacies (Fifth Edition)* (St. Martin's, 1994), pp. 106-107.

Context of Quote:

Reader John Congdon writes about the Jesse Jackson quote:

The problem is that Rev. Jackson was himself quoting Dr. Donald A. Carson, professor of New Testament at the Trinity Evangelical Divinity School and the author of several books, including (interestingly enough) one entitled Exegetical Fallacies.

The full quote, which Dr. Carson ascribes to his father, a Canadian minister, was "A text without a context is a pretext for a proof text."

A "proof text" was originally a neutral term for the scriptural text that proved (or was seen to prove) a particular doctrine. However, the overuse and even abuse of proof texts (i.e., Quoting Out of Context as an Appeal to Authority) to defend practically any position eventually led to "proof text" taking on a mainly negative—sometimes even pejorative—connotation (Guilt by Association, anyone?).

So, the original quote makes your point even more strongly: a contextomy used as an appeal to authority is usually misleading. Of course, a false premise does not mean that the conclusion is *ipso facto* false. We need not commit the Fallacy Fallacy.

Of course, the irony of an incomplete quote in the "Quoting Out of Context" article is itself pretty funny.

Resource:

Donald A. Carson, Trinity Evangelical Divinity School.

Context of the Example:

Australopithecus afarensis is the latest fossil hominid to be thrust before the public as the oldest evidence of mankind's existence. Not many (if any) have held the stage for long; by now laymen could be forgiven for regarding each new arrival as no less ephemeral than the weather forecast.

Source: John Reader, "Whatever happened to Zinjanthropus?" *New Scientist*, March 26, 1981, p. 805.

Analysis:

Kofahl quotes Reader as evidence of his claim that "fossil hominids" are discredited, but Reader's previous sentence makes it clear that he is saying only that it is the title to "oldest evidence of mankind's existence" that is ephemeral. In other words, still older evidence is discovered with sufficient frequency to make the title of "oldest" short-lived. This is no evidence at all supporting Kofahl's contention, in fact it is contrary evidence. By omitting the first sentence, the impression is created that Reader is talking about *all* "fossil hominids", instead of just the oldest ones. This false impression is reinforced by Kofahl's misleading editorial insertion in brackets of the phrase "fossil hominids".

The Etymological Fallacy

Alias: Abuse of Etymology

Type: Genetic Fallacy

Example:

Formal logic fails us because of its assumptions. The postulates from which the mechanism springs are normally abstractions of a high order, words rather than things. The finest of automobiles will not run on a road of air; it must have solid ground under the wheels. The Greeks, with their assumption that words were real things, naturally enough soared into rarefied

regions. Human thinking has been short of oxygen ever since. … "Logos" is Greek for "word"; "logic" is the manipulation of words.
Source: Stuart Chase, *The Tyranny of Words* (1938), Chapter 13, p. 226.
Analysis

Exposition:

The etymology of a word is an account of its historical derivation from older words often from a different language. An older, usually archaic, word from which a current word is historically derived is called its "etymon". The term "etymological fallacy" is applied to two types of error:

1. **Semantic:** The etymological fallacy as a semantic error is the mistake of confusing the current meaning of a word with the meaning of one of its etymons, or of considering the meaning of the etymon to be the "real" or "true" meaning of the current word. If one's goal is to communicate, then the "real" or "true" meaning of a word is its current meaning. Since the meanings of words change over time, often considerably, the meaning of an etymon may be very different from the current meaning of the word derived from it. The fact that a word historically derives from an etymon may be interesting, but it cannot tell us the current meaning of the word.
2. **Logical:**The etymological fallacy as a logical mistake results when one reasons about the etymon as if the conclusion applied to the current word. This is a logical error similar to equivocation, which involves confusing two meanings of the same word; but it differs from equivocation in that the etymological fallacy involves the meanings of two different words, though those words are historically connected.

Source:

Robert J. Gula, *Nonsense: A Handbook of Logical Fallacies* (2002), pp. 48 & 161.

Resource:

The Etymological Fallacy, *Fallacy Files Weblog*, 6/12/2006

Analysis of the Example:

In the chapter from which this passage comes, Chase is arguing that formal logic is of little or no value because it involves manipulating words unconnected with reality. The passage commits two fallacies and sets up a logical boobytrap:

1. The Greek word "logos" is actually highly ambiguous, having the following meanings in addition to "word": speech, argument, explanation, principle, reason, among others. So, Chase commits a fallacy of equivocation in mentioning only one of these meanings, namely, the one which supports his argument, rather than others which undermine it—such as "argument" and "reason", which have an obvious bearing on the meaning of the English word "logic".
2. However, suppose that Chase were not equivocating, and that "logos" really only meant "word". Does this give any evidence to support his claim that formal logic is simply the manipulation of words? The suffix "-logy" which occurs in such English words as "biology", "psychology", and even "etymology", has the same source as "logic". Does this mean that "biology" is really just words about life? Of course not. Just as "biology" came to mean the science of life, so "logic" has come to mean the scientific study of reasoning. Thus, Chase has fallaciously appealed to etymology to support his conclusion.
3. Chase's analogy comparing formal logic to an automobile is very weak; hadn't he ever heard of airplanes? An alternative analogy would compare formal logic to a plane which can travel much faster than a car by lifting off of the ground and soaring into the atmosphere of abstraction. Of course, there may still be a danger of flying so high that the

air becomes too thin, but what is Chase's evidence that this has happened to formal logic? Perhaps the analogy as Chase gives it should be taken only as a colorful illustration of his point, rather than as a reason in its favor, so that it doesn't constitute a fallacious analogy. However, it is at least a boobytrap that might trip up a naive or unimaginative reasoner.

Source: G. B. Kerferd, "Logos" in *The Encyclopedia of Philosophy*, Paul Edwards, Editor in Chief (1972), Volume 5, pp. 83-84.

Acknowledgment: Thanks to Topher Cooper.

The Fallacy of Accent

Type: Ambiguity

History:

As with many named fallacies, Accent has had a long and checkered career. It is one of the thirteen fallacies identified by Aristotle in his pioneering work, *On Sophistical Refutations*. Specifically, it is one of the six language-dependent fallacies, of which Aristotle says "this is the number of ways in which we might fail to mean the same thing by the same names or expressions." Thus, according to Aristotle, Accent is a kind of fallacy of ambiguity.

To understand what Aristotle meant by "accent", one must know some things about the written Greek of his time. Today, in most printed Greek texts—including those of "the philosopher"—three accents are used to indicate pronunciation. In Aristotle's time, the accents were not a part of the written language, but were supplied by the reader's knowledge of spoken Greek, which is something that we lack today. For this reason, some words that were pronounced differently were spelled the same in classical Greek, that is, they were homographs ("written the same") but not homophones ("sound the same"). So, a written word could be ambiguous in a way that depended on how it was accented in speech.

It is clear, from what he wrote, that Aristotle was being thorough in including Accent in his catalog of types of ambiguity. It is less clear just how common ambiguity of this type was in his day, or how often it led to fallacious reasoning.

Exposition:

Putting aside historical issues, what about accent as a source of fallacy today? Is it possible to have ambiguity of accent in English, or other living languages? There are English homographs which are not homophones, "sewer", for instance. However, the different meanings of "sewer" are not accented differently; rather, the difference in pronunciation is due to the vowel sound in the first syllable. One example of an ambiguity of accent that I have been able to find in English are the two meanings of "resent"; though there is a difference in accent, there is also a difference in the pronunciation of the "s", so it is not a pure case of ambiguity of accent.

Consider the following sentence:

I resent that letter.

This sentence could mean either that one sent the letter again, or that one has a feeling of resentment towards it. So, the sentence could be a boobytrap. If you concluded, falsely, on the basis of the sentence, that the speaker sent the letter again, then you would have committed a fallacy of accent.

Morris Engel cites the similar ambiguity of "invalid", meaning "a chronically ill person", or "not truth-preserving". However, it's difficult to imagine a situation in which these different meanings would be confused. Here are some examples of other words in English which have different meanings when accented differently:

*ac*cent   ac*cent*

*in*crease	in*crease*
*in*sult	in*sult*
*re*cord	re*cord*

There seems to be a pattern of two-syllable noun/verb pairs in which the noun is accented on the first syllable and the verb is accented on the second. However, because the different accents mean different parts of speech, it is unlikely that the distinct meanings will be confused.

Exposure:

Ambiguities of accent occur rarely in English, so that boobytraps based on such accentual ambiguities will be even rarer, and outright fallacies of Accent rarest of all. In fact, I have found no uncontrived examples of Accent. Therefore, if fallacies are defined as "common or tempting forms of incorrect reasoning", then there is no "fallacy of Accent"—at least, in the English language. At any rate, I recommend that textbooks stop devoting space to Accent, since it is not a useful fallacy. Presumably, the main reason why it still sometimes appears is historical inertia.

Some writers on fallacies—e.g., Morris Engel in *With Good Reason*—discuss the fallacy of Quoting Out of Context under the name "Accent", on the grounds that a quote taken out of context changes the emphasis in a misleading way. However, this is stretching Aristotle's meaning of "accent", which referred specifically to accents on syllables, and not on whole passages. Moreover, the kind of ambiguity that quotation out of context can lead to is seldom accurately described as a shift of emphasis; rather, what the loss of context does is allow the natural ambiguity of words to assert itself. For this reason, I treat Quoting Out of Context as a separate, and genuine fallacy, for it is very common, in contrast to Accent.

Reader Response:

Mike Jones writes from Jinan, China:

The best example that I know of of accent ambiguity in English is the word "outright", which, unlike words like "record" and "refuse", does not have any change in vowel-sound between the two cases. As an adjective, "outright" is accented on the first syllable, and as an adverb, on the last. It also affords a natural (i.e., non-contrived) example of a fallacy of accent:

He said outright, "lies!"

At least in spoken form, without the aid of punctuation, it is ambiguous.

Thanks for the example, Mike! A couple of points in reply:

- The *Infoplease* dictionary confirms that "outright" may be accented differently as an adjective or adverb, but it gives the adverbial accentuation as equal on both syllables, which conforms with my own pronunciation. Perhaps there are regional differences in the way that it's accented.
- In my sense of the word, your example is still "contrived", that is, it is a made-up example as opposed to one gathered from some published source. However, it's better than my original "resent" example, though I still don't think that anyone is very likely to commit a fallacy due to accentual ambiguity.

Sources:

- Aristotle, On Sophistical Refutations
- S. Morris Engel, *With Good Reason: An Introduction to Informal Fallacies (5th Edition)* (St. Martin's Press, 1994), pp. 102-7.

Acknowledgments:

- My thanks to Derek Jensen for the examples of verb/noun pair accentual ambiguity.

- The print of the bust of Aristotle is available from AllPosters.

The Fallacy of Accident

Alias:

- A dicto simpliciter ad dictum secundum quid
- Dicto Simpliciter
- Sweeping Generalization

Type: Informal Fallacy



Quote…

No rule is so general, which admits not some exception.

…Unquote

Source: Robert Burton, *The Anatomy of Melancholy*

Form:

Xs are normally **Y**s.
A is an **X**. (Where **A** is abnormal.)
Therefore, **A** is a **Y**.

Example:

Birds normally can fly.
Tweety the Penguin is a bird.
Therefore, Tweety can fly.

Exposition:

The fallacy of Accident, one of Aristotle's thirteen fallacies, has been interpreted in various ways by subsequent logicians, perhaps because of the obscurity of The Philosopher's account. I will discuss only one of these interpretations here, due to its relation to recent developments in logic.

Consider the generalization "birds can fly" from the example. Now, it isn't true that *all* birds can fly, since there are flightless birds. "Some birds can fly" and "many birds can fly" are too weak. "Most birds can fly" is closer to what we mean, but in this case "birds can fly" is a "rule of thumb", and the fallacy of Accident is a fallacy involving reasoning with rules of thumb.

Common sense is full of rules of thumb which do not hold universally, but which hold "generally" or "as a general rule", as is sometimes said. Logicians have tended to ignore rules of thumb, probably because of their unscientific vagueness. However, in the past couple of decades, primarily due to research in artificial intelligence, which has shown the importance of such general rules for practical reasoning, there has been growing interest in so-called "default" or "defeasible" reasoning, of which rules of thumb are a part. As a consequence, there has also been a rebirth of interest in the fallacy of Accident.

The difference between rules of thumb and universal generalizations, is that the former have exceptions. For instance, flightless birds are exceptions to the rule of thumb that birds can fly. One might hope to represent this rule of thumb by the universal generalization "all non-flightless birds can fly", but even this is not correct, for flighted birds with broken wings cannot fly. One might still hope that some lengthy list of exceptions would do the trick. However, one can imagine many different scenarios in which a bird would not be able to fly: its feet are stuck in

quicksand, all of the air around it has suddenly rushed into space, it has developed a phobia about flying, etc. One might then try to sum up this diversity of cases under the rubric of "untypical", or "abnormal", and say: "All typical or normal birds can fly". This is exactly what a rule of thumb is.

Rules of thumb differ from statistical generalizations such as "90% of birds can fly" in that there is no specific proportion of flighted to flightless birds that determines normality. The rule of thumb doesn't even necessarily imply that the majority of birds can fly, though it would be unusual if this didn't hold. We can imagine, for instance, that there might be so many penguins in Antarctica that the majority of birds would be flightless. However, our notion of normality applies to the familiar, everyday birds we see in our backyards, rather than "exotics" on distant continents. Clearly, then, rules of thumb are specific to a cultural and temporal context.

The fallacy of Accident occurs when one either attempts to apply such a rule of thumb to an obviously abnormal instance, or when one treats the rule itself as if it were an exceptionless universal generalization, rather than a defeasible rule of thumb.

Source:

S. Morris Engel, *With Good Reason: An Introduction to Informal Fallacies (5th Edition)*, (St. Martin's, 1994).

Acknowledgement:

The penguin photo comes from the poster collection at AllPosters.

Affirming the Consequent

Alias:

- Asserting the Consequent
- Affirmation of the Consequent

Type: Fallacy of Propositional Logic

Form:

If **p** then **q**.
q.
Therefore, **p**.

Similar Validating Forms

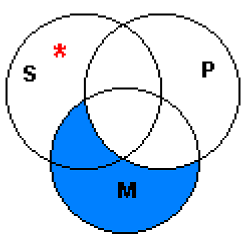
Modus Ponens	Modus Tollens
If **p** then **q**. **p**. Therefore, **q**.	If **p** then **q**. Not-**q**. Therefore, not-**p**.
Example	**Counter-Example**
If it's raining then the streets are wet. The streets are wet. Therefore, it's raining.	If it's snowing then the streets will be covered with snow. The streets are covered with snow. Therefore, it's snowing.

Exposition:

Affirming the Consequent is a non-validating form of argument in propositional logic; for instance, let "**p**" be false and "**q**" be true, then there is no inconsistency in supposing that the first, conditional premise is true, which makes the premises true and the conclusion false. Together with its similar sibling fallacy, Denying the Antecedent, instances of Affirming the Consequent are most likely to seem valid when we assume the converse of the argument's conditional premise. In the Example, for instance, we may assume:
(Suppressed Premise) If the streets are wet then it's raining.
Since wet streets usually dry rapidly, it is a good rule of thumb that wet streets indicate rain. With this suppressed premise, the argument in the Example is valid. So, in general, in an instance of the form Affirming the Consequent, if it is reasonable to consider the converse of the conditional premise to be a suppressed premise, then the argument is not fallacious, but a valid enthymeme.
In contrast, it would not be reasonable to consider the Counter-Example to be an enthymeme, since the converse of its conditional premise is not plausible, namely:
If the streets are covered with snow then it's snowing.
Unlike rain, we know, at cold temperatures it takes snow a very long time to evaporate. So that, while snow on the ground is a good sign of past snowing, it's a bad sign of present snowing. Thus, the Counter-Example is a fallacious instance of Affirming the Consequent.
Sibling Fallacy: Denying the Antecedent
Source:
A. R. Lacey, *A Dictionary of Philosophy (Third Revised Edition)* (Barnes & Noble, 1996).

Affirmative Conclusion from a Negative Premise
Type: Syllogistic Fallacy
Form:
Any form of categorical syllogism with an affirmative conclusion and at least one negative premise.

Example	Counter-Example
All judges are politicians. Some lawyers are not judges. Therefore, some lawyers are politicians.	All whales are mammals. Some fish are not whales. Therefore, some fish are mammals.



Venn Diagram:
This diagram represents both the **Example** and **Counter-Example**, and shows that neither is valid, since the conclusion, "Some **S** is **P**", is not shown to be true.
Syllogistic Rule Violated:
All validating forms of categorical syllogism which have one negative premise also have a negative conclusion.
Source:
Irving Copi & Carl Cohen, *Introduction to Logic (10th Edition)*, (Prentice Hall, 1998), pp. 277-8.

Affirming a Disjunct
Alias:

- Affirming One Disjunct
- The Fallacy of the Alternative Syllogism
- Asserting an Alternative
- Improper Disjunctive Syllogism

Type: Fallacy of Propositional Logic

Forms

p or **q**. **p**. Therefore, not-**q**.	**p** or **q**. **q**. Therefore, not-**p**.

Similar Validating Forms (Disjunctive Syllogism)

p or **q**. Not-**p**. Therefore, **q**.	**p** or **q** Not-**q**. Therefore, **p**.

Examples

Today is Saturday or Sunday. Today is Saturday. Therefore, today is not Sunday.	Today is Saturday or Sunday. Today is Sunday. Therefore, today is not Saturday.

Exposition:

Affirming a Disjunct is a non-validating form of argument when "or" is inclusive (see below), as it is standardly interpreted in propositional logic. As with other propositional fallacies, an argument which affirms a disjunct is most likely to seem valid when we take into consideration some further information not explicitly mentioned in the argument. In the case of Affirming a Disjunct, this is:

Suppressed Premise: Not both **p** and **q**.

If we have some reason to believe that the two disjuncts are contraries, then the argument may be a valid enthymeme. In contrast, if we cannot rule out the truth of both disjuncts, then the argument is fallacious.

Exposure:

Most logic texts claim that "or" has two meanings:

1. Inclusive (or "weak") disjunction: One or both of the disjuncts is true, which is what is meant by the "and/or" of legalese.
2. Exclusive (or "strong") disjunction: Exactly one of the disjuncts is true.

As a form of argument, Affirming One Disjunct is perfectly valid for the exclusive sense of "or". It is only for the inclusive sense that it is a non-validating form. For this reason, if the textbook account is correct, there is a problem of ambiguity in the above two argument forms, which faces the application of Affirming One Disjunct as a fallacy. In order to accuse an argument of committing this fallacy, we must determine in which sense the "or" in the first premise is used.

Sources:

- Robert Audi (General Editor), *The Cambridge Dictionary of Philosophy (Second Edition)*, 1995, p. 316.
- William L. Reese, *Dictionary of Philosophy and Religion* (Humanities Press, 1980), p. 169.

Ambiguity

Type: Informal Fallacy

Example:

President Clinton should have been impeached only if he had sexual relations with Monica Lewinsky.
He did not have sexual relations with Lewinsky.
Therefore, he should not have been impeached.

Exposition:

As a feature of language, ambiguity occurs when a word or phrase has more than one meaning. For instance, the word "note" can mean either:

1. A musical tone.
2. A short written record.

In fact, the *Random House College Dictionary* lists twenty meanings of "note", though one of these is archaic. Even the part of speech is ambiguous, since "note" can be either a noun or verb. This situation is not at all unusual, and "note" is not a particularly ambiguous word. Opening any dictionary at random will confirm that it is the rare word that is not ambiguous. In fact, ambiguity tends to increase with frequency of usage, and it is rarely-used technical terms that are unambiguous. For instance, "is" is highly ambiguous and has, as a result, caused much mischief in metaphysics, and even politics.

As a logical fallacy, Ambiguity occurs when linguistic ambiguity causes the form of an argument to appear validating when it is not.

Exposure:

Because of the ubiquity of ambiguity in natural language, it is important to realize that its presence in an argument is not sufficient to render it fallacious, otherwise, *all* such arguments would be fallacious. Most ambiguity is logically harmless, a fallacy occurring only when ambiguity causes an argument's form to appear validating when it is not. Consider the **Example**: If the phrase "sexual relations" is being used univocally, then it has the following form:

p only if **q**.
Not-**q**.
Therefore, not-**p**.

This is, of course, a version of the validating form Modus Tollens. However, if "sexual relations" has one meaning in the first premise, and a different meaning in the conclusion, then it is used ambiguously, and the argument has the following non-validating form:

p only if **q**.
Not-**r**.
Therefore, not-**p**.

Such an argument commits a Fallacy of Ambiguity (specifically, Equivocation), because it may seem to have a validating form when the audience interprets the ambiguous phrase univocally. Thus, arguments which commit the Fallacy of Ambiguity can seem to be valid.

Boobytrap:

While not always a fallacy, ambiguity is frequently misleading. For instance, in the much publicized statement by President Clinton:
I did not have sexual relations with that woman, Miss Lewinsky.
Source: Howard Kurtz, *Spin Cycle: Inside the Clinton Propaganda Machine* (Touchstone, 1998), p. 297.

This claim was testimony, rather than argument, so it cannot be fallacious. However, it is now clear that it was intended to snare the listener into concluding, falsely, that there was no sexual relationship between the President and Miss Lewinsky. The ambiguity came from the phrase "sexual relations", which has a broad and narrow meaning:

1. A sexual relationship
2. Sexual intercourse

As he later admitted, President Clinton had had "sexual relations" with Miss Lewinsky in the broad sense (1), and he was denying it only in the narrow sense (2).

Funny Fallacy:

Unintentionally ambiguous statements are frequently sources of humor, especially when one of the possible meanings is ludicrous. For example:

Police blotter

Sent city police out at 11:38 a.m. to kick kids off the roof of a downtown furniture store.

Source: Jay Leno (compiler), *More Headlines: Real but Ridiculous Samplings from America's Newspapers* (Warner Books, 1990), p. 8.

Subfallacies:

- Accent
- Amphiboly
- Equivocation
- Quoting Out of Context

Source:

S. Morris Engel, *Fallacies and Pitfalls of Language: The Language Trap* (Dover, 1994), Chapter 2.

Resources:

- Headlines: Ambiguity
  Humorous Headlines Torn from Today's Newspapers
- Kent Bach, "Ambiguity", *Routledge Encyclopedia of Philosophy*
  A good, but moderately technical, encyclopedia entry discussing types of ambiguity.

Ambiguous Middle

Alias:

- Ambiguous Middle Term
- Four-Term Fallacy

Type:

- Equivocation
- Four-Term Fallacy

Form:

Any valid form of categorical syllogism with an ambiguous middle term.

Example	Counter-Example
All human fetuses are human. Any human has the right to life. Therefore, all human fetuses have the right to life.	All dog organs are canine. Any canine must be on a leash. Therefore, all dog organs must be on a leash.

Exposition:

A categorical syllogism is, by definition, an argument with three categorical terms occurring within it. "Term" is to be understood in a semantic sense, so that a single word may ambiguously stand for two terms. This leads to the possibility of ambiguous syllogisms in which one of the words equivocates on two terms. Such a syllogism may commit the fallacy of Equivocation. Thus, Ambiguous Middle is the fallacy of Equivocation when it occurs within the premises of a categorical syllogism.

Source:

William L. Reese, *Dictionary of Philosophy and Religion* (Humanities Press, 1980), p. 169.

Reader Response:

Jim wrote in with a criticism of the **Example** used above:

When someone says in an argument that "All human fetuses are human," I believe it is clear to most people that what they mean is "All human fetuses are humans," that is "are human beings," but have simply made a grammatical error that has become acceptable through common usage. To say that the term "human" in this statement is ambiguous is to be purposely obtuse. That you know that the word "human" in the first premise is meant to be taken as a noun and not as an adjective becomes clear in your counter example where you chose to substitute "dog organs" for "canine organs" to make the counter example clearer/more intelligible. The premise "All canine organs are canine" sounds silly whereas the premise "All human fetuses are human" does not.

Your "counter example" becomes:

All dog organs are dogs.

Any dog must be on a leash.

Therefore, all dog organs must be on a leash.

and is wrong because the first premise is wrong, not because of equivocation.

A couple of points in reply:

- You seem to be under the misimpression that the argument in the **Example** is someone else's argument, but it is a cooked-up example, that is, it's *my* argument. However, it is based on some real-life arguments that I have studied, but cleaned-up and made more explicit. For instance, the argument used as an **Example** of Equivocation is essentially the same as the above **Example**. What I have done is to take the argument and turn it into a categorical syllogism in order to illustrate the syllogistic fallacy of Ambiguous Middle, which is an equivocation occurring in a syllogism. Unfortunately, arguments as they occur in the raw often don't make good examples. I use real examples whenever possible, but the point of the examples and counter-examples is to help people understand the nature of the fallacy, and real world arguments are often poor examples. For this reason, the examples that I use are often too obviously fallacious; they would never fool anyone.
- Arguments which commit a fallacy of ambiguity have two meanings. On one meaning, the argument is valid, but one of the premises is false or controversial. On the other meaning, the premises are uncontroversially true, but the argument is invalid. Here are the two meanings of the Example:
    1. All human fetuses are the fetuses of human beings.
Any human being has the right to life.
Therefore, all human fetuses have the right to life.
    2. All human fetuses are human beings.
Any human being has the right to life.
Therefore, all human fetuses have the right to life.

The premises of the first argument are both uncontroversially true, but it is an invalid syllogism. The second argument—which is the way in which you are interpreting the **Example**—is a perfectly valid syllogism of the form Barbara, but it has a controversial first premise. No one who disagreed with the conclusion would be likely to agree with the first premise. For this reason, despite the fact that the argument is valid, it commits a different fallacy, namely, Begging the Question, that is, it has a question-begging first premise.

The way in which ambiguous arguments are persuasive is by combining both these meanings into one, so that they seem to be both valid and to have uncontroversial premises. But it is only by switching back and forth mentally between the two meanings of the ambiguous term that such an argument will seem to be sound.

Thanks for raising a difficult issue, Jim, and I hope that this clarifies it at least a little.

The Anecdotal Fallacy

Alias: The Volvo Fallacy

Type: Biased Sample

Thought Experiment:

Let us suppose that you wish to buy a new car and have decided that on grounds of economy and longevity you want to purchase one of those solid, stalwart, middle-class Swedish cars—either a Volvo or a Saab. As a prudent and sensible buyer, you go to *Consumer Reports*, which informs you that the consensus of their experts is that the Volvo is mechanically superior, and the consensus of the readership is that the Volvo has the better repair record. Armed with this information, you decide to go and strike a bargain with the Volvo dealer before the week is out. In the interim, however, you go to a cocktail party where you announce this intention to an acquaintance. He reacts with disbelief and alarm: "A Volvo! You've got to be kidding. My brother-in-law had a Volvo. First, that fancy fuel injection computer thing went out. Had to replace it. Then the transmission and the clutch. Finally sold it in three years for junk."

Would you still buy the Volvo?

Source: Nisbett, R.E., et al., "Popular Induction: Information is Not Always Informative", in J.S. Carroll & J.W. Payne (Editors), *Cognition and Social Behavior*, Halsted, 1976

Exposition:

People tend to judge the probabilities of types of event by using what is called the "availability", or "ease of representation", heuristic.

The Availability Heuristic: The easier it is to remember, or to imagine, a type of event, the more likely it is that an event of that type will occur.

Like all rules of thumb, the ease of remembering or imagining—"representing"—a type of event is usually good evidence of degree of likelihood in ordinary circumstances. Instances of a type of event which we frequently experience will be easily remembered, so that that type will be correctly judged to be likely by the heuristic. Similarly, if there are many ways that a kind of event can come about, then it will be easy to imagine and also likely to happen. Moreover, if one has a hard time remembering an event of a given sort, then it is probably rare and unlikely. Also, if we cannot even imagine it, then there is probably almost no way for it to occur.

However, as with all rules of thumb, there are circumstances in which the Availability Heuristic leads to false results. Unusual events do happen, and if they happen to us then we tend to overestimate their likeliness when using the Availability Heuristic. You may have had the experience of seeing an accident on the road, then slowing down and driving more carefully afterwards. Of course, it's a good idea to slow down in the immediate vicinity of an accident scene, since there may be wreckage on the road. Also, it's possible that the accident took place where it did because the area is an unusually dangerous one. However, the vivid memory of the accident and your heightened caution may have lasted after you were away from the accident scene. The experience of seeing one makes accidents more available to your memory and imagination, thus making them seem more probable. However, the probability of getting in an accident in one place is not increased by seeing one in another. But when an unusual event is presented vividly to our minds, it becomes more available; and becoming more available, it seems more likely.

The Anecdotal Fallacy occurs when a recent memory, an unusual event, or a striking anecdote leads one to overestimate the probability of events of that type occurring—especially if one has access to better evidence of the frequency of such events. For instance, in the Thought Experiment, if the vividness of your acquaintance's anecdote about his brother-in-law's experience is enough to change your decision to buy the Volvo, you have committed the fallacy.

Sources:

- Daniel Kahneman, Paul Slovic & Amos Tversky (editors), *Judgment Under Uncertainty: Heuristics and Biases* (Cambridge University Press, 1982), Part IV.
- Massimo Piattelli-Palmarini, *Inevitable Illusions: How Mistakes of Reason Rule Our Minds* (John Wiley & Sons, 1994), p. 190.

Acknowledgment:

Thanks to Stephen Rowe for a criticism of the auto accident example which led me to revise it.

Bandwagon Fallacy



Etymology:

The name "bandwagon fallacy" comes from the phrase "jump on the bandwagon" or "climb on the bandwagon", a bandwagon being a wagon big enough to hold a band of musicians. In past political campaigns, candidates would ride a bandwagon through town, and people would show support for the candidate by climbing aboard the wagon. The phrase has come to refer to joining a cause because of its popularity.

Alias:

- Appeal to Popularity
- Argument by Consensus
- Argumentum ad Populum
- Authority of the Many

Type: Red Herring

Form:
Idea **I** is popular.
Therefore, **I** is correct.
Example:
Everyone is selfish; everyone is doing what he believes will make himself happier. The recognition of that can take most of the sting out of accusations that you're being "selfish." Why should you feel guilty for seeking your own happiness when that's what everyone else is doing, too?
Source: Harry Browne, "The Unselfishness Trap", from *How I Found Freedom in an Unfree World* (1973).
Exposition:
The Bandwagon Fallacy is committed whenever one argues for an idea based upon an irrelevant appeal to its popularity.
Exposure:
Advertising is a rich source of Bandwagon arguments, with many products claiming to be "number 1" or "most popular", even though this is irrelevant to the product's merits.
Source:
S. Morris Engel, *With Good Reason: An Introduction to Informal Fallacies (Fifth Edition)* (St. Martin's, 1994), pp. 223-225.
Resource:
James B. Freeman, "The Appeal to Popularity and Presumption by Common Knowledge", in *Fallacies: Classical and Contemporary Readings*, edited by Hans V. Hanson and Robert C. Pinto (Penn State Press, 1995), pp. 265-273.

Appeal to Misleading Authority



Alias:

- Appeal to Authority
- Argument from Authority
- Argumentum ad Verecundiam
  Translation: "Argument from respect/modesty", *Latin*
- Ipse Dixit
  Translation: "He, himself, said it", *Latin*

Type: Genetic Fallacy
Form:

Authority **A** believes that **P** is true.
Therefore, **P** *is* true.

Quote…

[I]t is not *what* the man of science believes that distinguishes him, but *how* and *why* he believes it. His beliefs are tentative, not dogmatic; they are based on evidence, not on authority or intuition.

…Unquote

Source: Bertrand Russell, *A History of Western Philosophy* (Book-of-the-Month Club, 1995), p. 527.

Example:

Cheating by the Soviets

Barry Schweid of the Associated Press, in his efforts to criticize President Reagan's space-based defense against Soviet missiles, came up with a report from some Stanford University group that claimed to find little evidence of cheating by the Soviet Union on arms-control treaties.

Where were they when Secretary of Defense Caspar Weinberger and George Shultz, secretary of state, and several members of our military forces went on TV and described and enumerated the different times and ways that the Soviet Union has cheated on the 1972 Anti-Ballistic Missile Treaty?

Does Schweid really believe that the group at Stanford is more knowledgeable about U.S. arms-control policy than all our military experts, with Congress thrown in for good measure? If I thought that was true, I wouldn't sleep much tonight. And I doubt if he would either.

Source: Middleton B. Freeman, Louisville, "Letters From Readers", *The Courier-Journal*, April 1, 1987.

Analysis

Exposition:

We must often rely upon expert opinion when drawing conclusions about technical matters where we lack the time or expertise to form an informed opinion. For instance, those of us who are not physicians usually rely upon those who are when making medical decisions, and we are not wrong to do so. There are, however, four major ways in which such arguments can go wrong:

1. An appeal to authority may be inappropriate in a couple of ways:
    - It is unnecessary. If a question can be answered by observation or calculation, an argument from authority is not needed. Since arguments from authority are weaker than more direct evidence, go look or figure it out for yourself.
      The renaissance rebellion against the authority of Aristotle and the *Bible* played an important role in the scientific revolution. Aristotle was so respected in the Middle Ages that his word was taken on empirical issues which were easily decidable by observation. The scientific revolution moved away from this over-reliance on authority towards the use of observation and experiment.
      Similarly, the *Bible* has been invoked as an authority on empirical or mathematical questions. A particularly amusing example is the claim that the value of *pi* can be determined to be 3 based on certain passages in the Old Testament. The value of *pi*, however, is a mathematical question which can be answered by calculation, and appeal to authority is irrelevant.
    - It is impossible. About some issues there simply is no expert opinion, and an appeal to authority is bound to commit the next type of mistake. For example,

many self-help books are written every year by self-proclaimed "experts" on matters for which there is no expertise.

2. The "authority" cited is not an expert on the issue, that is, the person who supplies the opinion is not an expert at all, or is one, but in an unrelated area. The now-classic example is the old television commercial which began: "I'm not a doctor, but I play one on TV...." The actor then proceeded to recommend a brand of medicine.
3. The authority is an expert, but is not disinterested. That is, the expert is biased towards one side of the issue, and his opinion is thereby untrustworthy.
   For example, suppose that a medical scientist testifies that ambient cigarette smoke does not pose a hazard to the health of non-smokers exposed to it. Suppose, further, that it turns out that the scientist is an employee of a cigarette company. Clearly, the scientist has a powerful bias in favor of the position that he is taking which calls into question his objectivity.
   There is an old saying: "A doctor who treats himself has a fool for a patient," and a similar version for attorneys: "A lawyer who defends himself has a fool for a client." Why should these be true if the doctor or lawyer is an expert on medicine or the law? The answer is that we are all biased in our own causes. A physician who tries to diagnose his own illness is more likely to make a mistake out of wishful thinking, or out of fear, than another physician would be.
4. While the authority is an expert, his opinion is unrepresentative of expert opinion on the subject. The fact is that if one looks hard enough, it is possible to find an expert who supports virtually any position that one wishes to take. "Such is human perversity", to quote Lewis Carroll. This is a great boon for debaters, who can easily find expert opinion on their side of a question, whatever that side is, but it is confusing for those of us listening to debates and trying to form an opinion.
   Experts are human beings, after all, and human beings err, even in their area of expertise. This is one reason why it is a good idea to get a second opinion about major medical matters, and even a third if the first two disagree. While most people understand the sense behind seeking a second opinion when their life or health is at stake, they are frequently willing to accept a single, unrepresentative opinion on other matters, especially when that opinion agrees with their own bias.
   Bias (problem 3) is one source of unrepresentativeness. For instance, the opinions of cigarette company scientists tend to be unrepresentative of expert opinion on the health consequences of smoking because they are biased to minimize such consequences. For the general problem of judging the opinion of a population based upon a sample, see the Fallacy of Unrepresentative Sample.

To sum up these points in a positive manner, before relying upon expert opinion, go through the following checklist:

- Is this a matter which I can decide without appeal to expert opinion? If the answer is "yes", then do so. If "no", go to the next question:
- Is this a matter upon which expert opinion is available? If not, then your opinion will be as good as anyone else's. If so, proceed to the next question:
- Is the authority an expert on the matter? If not, then why listen? If so, go on:
- Is the authority biased towards one side? If so, the authority may be untrustworthy. At the very least, before accepting the authority's word seek a second, unbiased opinion. That is, go to the last question:

- Is the authority's opinion representative of expert opinion? If not, then find out what the expert consensus is and rely on that. If so, then you may rationally rely upon the authority's opinion.

If an argument to authority cannot pass these five tests, then it commits the fallacy of appeal to misleading authority.

Exposure:

Since not all arguments from expert opinion are fallacious, some authorities on logic have taken to labelling this fallacy as "appeal to *inappropriate* or *irrelevant* or *questionable* authority", rather than the traditional name "appeal to authority". For the same reason, I use the name "appeal to *misleading* authority" to distinguish fallacious from non-fallacious arguments from authority.

Sources:

- Irving M. Copi & Carl Cohen, *Introduction to Logic (Tenth Edition)* (Prentice Hall, 1998), pp. 165-166.
- T. Edward Damer, *Attacking Faulty Reasoning: A Practical Guide to Fallacy-Free Arguments (Third Edition)* (Wadsworth, 1995), pp. 31-34.

Resources:

- James Bachman, "Appeal to Authority", in *Fallacies: Classical and Contemporary Readings*, edited by Hans V. Hanson and Robert C. Pinto (Penn State Press, 1995), pp. 274-286.
- Robert Todd Carroll, "Appeal to Authority", *The Skeptic's Dictionary*.

Case Study: The Hollow Man: The Strange Case of David Manning

Reader Response:

John Congdon writes:

A thought about the "Appeal to Misleading Authority" fallacy. In your section on this fallacy, you propose a five-point checklist for determining if an appeal to authority is appropriate. I would suggest a sixth: "Is there opinion available from this expert on this subject?". In other words, does the authority actually support the appeal, or are the authority's words being taken out of context or otherwise misunderstood?

I have seen similar checklists for evaluating arguments from authority which include such a point. However, there are two reasons why there is no such point on my list:

1. Certainly, when evaluating an appeal to authority for cogency, the first step one should take is to verify that the authority is cited correctly. If the authority's position is either misquoted, misrepresented, or misunderstood, then the argument will be uncogent due to a false premise. However, having a false premise is not, in my view, a logical fault, but is a factual fault. Factual errors can be just as important as logical errors, but they are distinct types of error.
2. Quoting out of context is a fallacy in its own right. It is uncommon to treat quoting out of context as a separate fallacy, but I do so because it is a more common error than a number of traditional fallacies. Because I treat it separately, I don't include it in the checklist for appeal to misleading authority. However, it is true that quoting out of context often occurs in appeals to authority, so it is something to watch out for.

Acknowledgements:

My thanks to Dr. Gary Foulk for critiquing this entry, though I did not take all of his advice. Also, thanks to readers Stephen Beecroft, Brandon Milam, and Sarah Natividad for criticizing

the Analysis of the Example, which led me to revise it. An additional thank you to Theo Clark for calling the Russell quote to my attention.

Analysis of the Example:

The example commits the fallacy of Ad Verecundiam because most of the authorities cited are not disinterested (problem 3). Weinberger and Shultz were members of Reagan's cabinet, and could be counted on to support his proposals. Similarly, members of the armed forces are not encouraged to disagree with the Commander-In-Chief, especially when the services stand to benefit from the proposal. The one exception in this letter is Congress, which was controlled by the opposition party, but this evidence is added as an afterthought and is difficult to assess. In contrast, the Stanford University group cited by Schweid was disinterested, so far as we can tell from the letter.

Some readers have suggested that the Stanford University group might be ideologically biased against a space-based missile defense. However, even if true—and there is no evidence from the letter that it is—members of the administration were likely to be ideologically biased in *favor* of such a system. So, ideological bias is a tie between the two sources. The problem with the administration authorities is not ideological bias, but institutional bias in favor of an employer. The Stanford University group lacks that kind of bias.

Appeal to Celebrity



Type: [Appeal to Misleading Authority]()

Form:

Celebrity **C** endorses Brand **X** (or Candidate **Y**, or Cause **Z**).
Therefore, Brand **X** (or Candidate **Y**, or Cause **Z**) is good.

Example:

Charley Garment was a methodical little man with a beard who had been producer of the Monitor show on NBC radio. … [He] came to supervise a series of endorsements… There were two kinds: political and celebrity. …[T]he day [he] started, the only names on the celebrity list were Art Linkletter, Connie Francis, Pat Boone, John Wayne, and Lawrence Welk. … The first job [he] was given was to film a commercial with Connie Francis.

"I don't know whether it's better to have her come on straight or open up with a scene of her listening to the end of her own recording of the Nixon jingle," [he] was saying. "Then we could have the announcer come out and say, 'Well, Connie, we know you like Richard Nixon. How about telling us why?' And then she could go into it." …

Connie Francis once had been very popular with those records where her voice was recorded on several different tracks and then all the tracks were played together so she sounded like the McGuire Sisters. Later, when that novelty wore off, she began to make records of Italian songs. Much later, when even the Italian songs were not getting played much on the radio, she started to show up at places like the Merv Griffin Show…

The commercial ran on the Laugh-In show in September. The next day, in the *Times*, Jack Gould wrote that it "embraced all the ills of the oversimplified campaign spot announcement. … Admittedly, it is a forlorn hope but one could wish that the supporters of Mr. Nixon, Vice President Humphrey and Mr. Wallace would keep tawdry advertising pitches out of the business of choosing a President."

Source: Joe McGinniss, *The Selling of the President 1968* (Pocket Books, 1972), pp. 74-76.

Exposition:

Appealing to celebrity is one of the most common forms of fallacious appeal to authority. Celebrity endorsement of products is so common that we hardly notice it or wonder why Michael Jordan is trying to sell us underwear. Moreover, in addition to products, celebrities often endorse political candidates, and during every presidential election year each candidate rounds up his own stable of famous supporters. In addition, celebrities publicly espouse every political, religious, and charitable cause, and some has-beens build second careers in the public eye as spokespeople for causes.

What is wrong with appealing to celebrity? There are two problems:

1. Since most celebrities are actors or sports stars, they are seldom experts on the products or causes that they endorse. Sometimes the advertisers even attempt to exploit confusion between fantasy and reality by selecting actors to endorse products based on the fictional characters they play. Famously, one old television commercial for cough syrup began with an actor saying: "I'm not a doctor, but I play one on TV." Similarly, the actor Robert Young, who was best known for his television role as "Marcus Welby, M.D.", was a spokesman for decaffeinated coffee. These were not real doctors, but make-believe ones, who did not have real medical expertise, just make-believe expertise.

   Of course, sports celebrities often endorse athletic shoes and other equipment, and it is at least plausible that they have expertise with these products. However, they raise the second problem with celebrity appeals:
2. Most celebrities who endorse products are paid to do so, and thus the endorsement is not a disinterested one. Celebrities who endorse charities or political candidates probably are not paid money, but they often benefit from the association with a good cause or the publicity that comes from controversy.

   Some advertisers attempt to use doublespeak to disguise the fact that their spokespersons are paid. They put the words "compensated endorsement" in small print at the bottom of the screen, apparently hoping that the viewers will not understand that these eleven-letter words mean that the spokesperson is paid.

Exposure:

Who are celebrities? Essentially, they are people famous enough that their names and faces are recognized by the average person, who may know little else about them. Celebrity status is primarily determined by appearance on television, though movies are also still important. So, most celebrities are actors, musicians, or sport players. A few politicians and an occasional author or artist manage to break into the ranks of celebrity, but this is still usually the result of appearing on TV. There are also those who gain fleeting celebrity—"fifteen minutes of fame"—through connection with some public scandal or notorious crime. Some celebrities are even "famous for being famous"; we know that the person is well-known, but we no longer know why. Presumably, at some point earlier in their lives, such celebrities did something to gain fame, but having attained celebrity status they maintain it by using it to get publicity. Celebrities are rarely police officers, firefighters, soldiers, physicians, nurses, scientists, or teachers. They are, instead, people who are good at pretending to be all of these things. It is useful to keep this in mind when they try to sell us a product, a presidential candidate, a charity, or a political cause.

Resources:

- Appeal to Celebrity, 1/30/2003
- Straw Woman, 2/25/2003
- Debate Fallacies, Part 5, 10/13/2004
- The Cult of Celebrity, 10/11/2005
- Silly Celebrity, 3/25/2006

Acknowledgment:

The Marilyn Monroe tin sign is available from AllPosters.

Appeal to Consequences

Alias:

- Appeal to Consequences of a Belief
- Argumentum ad Consequentiam

  Translation: Argument to the consequences, *Latin*

Type: Red Herring

Forms

(Belief in) **p** leads to good consequences. (Where the good consequences are irrelevant to the truth of **p**.) Therefore, **p** is true.	(Belief in) **p** leads to bad consequences. (Where the bad consequences are irrelevant to the falsity of **p**.) Therefore, **p** is false.

Example:

…I want to list seventeen summary statements which, if true, provide abundant reason why the reader should reject evolution and accept special creation as his basic world-view. …

13. Belief in special creation has a salutary influence on mankind, since it encourages responsible obedience to the Creator and considerate recognition of those who were created by Him. …

16. Belief in evolution and animal kinship leads normally to selfishness, aggressiveness, and fighting between groups, as well as animalistic attitudes and behaviour by individuals.

Source: Henry M. Morris, *The Remarkable Birth of Planet Earth* (Creation-Life Publishers, 1972), pp. vi-viii.

Analysis

Exposition:

Arguing that a proposition is true because belief in it has good consequences, or that it is false because belief in it has bad consequences is often an irrelevancy. For instance, a child's belief in Santa Claus may have good consequences in making the child happy and well-behaved, but these facts have nothing to do with whether there really *is* a Santa Claus.

Beliefs have many consequences, both good and bad. For instance, belief that smoking cigarettes causes lung cancer may have such bad consequences as frightening cigarette smokers or making them depressed, but it may also have such good consequences as motivating people to stop smoking, thus lowering their risk of cancer. However, the most important consequences of the belief, or lack thereof, that smoking causes lung cancer are affected by the *fact* that it does so. In other words, we cannot determine the truth-value of a belief from its consequences alone, since many of those consequences are dependent upon its truth-value. If smoking didn't cause disease, then the bad consequences of believing it does would greatly outweigh the benefits; but since it does, the situation is reversed.

Since the irrelevancy of belief to truth-value is intuitively obvious, it is often suppressed in fallacious Arguments to the Consequences. However, one can tell that the fallacy is being committed because the supposed consequences do not follow from the proposition itself, but only from belief in it.

Exposure:

There are two types of cogent argument with which this fallacy is easily confused:

1. When an argument concerns a policy or plan of action—instead of a proposition—then it is reasonable to consider the consequences of acting on it.
2. When an argument is about a proposition, it is reasonable to assess the *truth-value* of any *logical* consequences of it. Logical consequences should not be confused with causal consequences, and truth or falsity should not be confused with goodness or badness.

Appeals to Consequences differ from these cogent forms of argument in the following ways:

1. The argument is not about a plan or policy, but a proposition which therefore has a truth-value.
2. The argument does not concern the truth-value of logical consequences of the proposition, but the good or bad causal consequences of believing it.

Subfallacies:

- Appeal to Force
- Wishful Thinking

Source:

David Hackett Fischer, *Historians' Fallacies: Toward a Logic of Historical Thought* (Harper & Row, 1970), pp. 300-302.

Resource:

Dr. Michael C. Labossiere, "Appeal to Consequences of a Belief"

Analysis of the Example:

Two of the seventeen reasons that Morris gives for belief in creationism are appeals to consequences: **13** is an appeal to the supposed good consequences—"salutary influence"—of believing in creationism, and **16** is an appeal to the supposedly bad consequences of belief in evolution. One may doubt whether these are really consequences of these beliefs, but even if so they are irrelevant to the truth or falsity of creationism and evolution. Even if belief in creationism makes people polite and well-behaved, it may be false for all that; even if belief in

evolution tends to make people selfish and aggressive, it may be true for all that. Belief in Santa Claus may make people less selfish and aggressive, but sorry, Virginia, there is no Santa Claus.

Emotional Appeal



Type: Red Herring

Exposition:

An appeal to emotion is a type of argument which attempts to arouse the emotions of its audience in order to gain acceptance of its conclusion. Despite the example of Mr. Spock from the original *Star Trek* television series, emotion is not always out of place in logical thinking. However, there is no doubt that strong emotions can subvert rational thought, and playing upon emotions in an argument is often fallacious.

When are appeals to emotion appropriate, and when are they fallacious? No student would attempt to prove a mathematical theorem by playing upon the teacher's sympathy for the long hours of hard work put into it. Such an appeal would be obviously irrelevant, since either the proof is correct or it is flawed, despite the student's best efforts. In contrast, if the teacher attempts to motivate the student to work on proving the theorem by invoking the specter of a failing grade, this appeal to fear is not irrelevant.

So, one distinction between relevant and fallacious appeals to emotion is based on the distinction between arguments which aim to motivate us to action, and those which are intended to convince us to believe something. Appeals to emotion are always fallacious when intended to influence our beliefs, but they are sometimes reasonable when they aim to motivate us to act. The fact that we desire something to be true gives not the slightest reason to believe it, and the fact that we fear something being true is no reason to think it false; but the desire for something is often a good reason to pursue it, and fear of something else a good reason to flee.

Even when appeals to emotion aim at motivating us, there is still a way that they may fail to be rational, namely, when what we are being persuaded to do has insufficient connection with what is arousing our emotion. For instance, a familiar type of emotional appeal is the appeal to pity or sympathy, which is used by many charities. Photographs of crippled or hungry children are shown in order to arouse one's desire to help them, with the charity trying to motivate you to write a check. However, there may be little or no connection between your check and the poor children you wish to help. Certainly, your money will probably not help the *specific* children you see in such appeals. At best, it may go to help some *similar* children who need help. At worst, it

may go into further fundraising efforts, and into the pockets of the people who work for the charity.

Subfallacies:

- Appeal to Envy (AKA, *Argumentum ad Invidiam*)
- Appeal to Fear (AKA, *Argumentum ad Metum*)
- Appeal to Hatred (AKA, *Argumentum ad Odium*)
- Appeal to Pity (AKA, *Argumentum ad Misericordiam*)
- Appeal to Pride (AKA, *Argumentum ad Superbium*)
- Wishful Thinking

Source:

T. Edward Damer, *Attacking Faulty Reasoning: A Practical Guide to Fallacy-Free Arguments (Third Edition)* (Wadsworth, 1995), pp. 44-56.

Resource:

Douglas Walton, *The Place of Emotion in Argument* (Penn State, 1992).

Appeal to Force



Alias: Argumentum ad Baculum
Translation: "Argument from the stick", *Latin*
Type: Appeal to Consequences

Exposition:

Appeal to Force is a technique of distraction which occurs when force, or the threat of force, is used to "win" a debate. More frequently, it is used to cover up the fact that the threatener is

losing. The name "argumentum ad baculum" alludes to the use of a stick, or club, to beat someone.

This fallacy is committed whenever force or the threat of it is introduced into a rational discussion in order to derail it. For example, extremists will disrupt debates by starting riots when their side appears to be losing. Even audience members "shouting down" a debater whom they disagree with in order to prevent a case from being heard are resorting to "ad baculum".

Exposure:

Force, or the threat of it, is not an argument. Of course, this is what is wrong with the Appeal to Force, since it involves abandoning rational persuasion. However, this fact also makes this a rather difficult "fallacy" to classify. Since hitting someone over the head with a stick is not an argument at all, *a fortiori* it is not a *fallacious* one.

A threat made in words may look more like an argument, with a premise and conclusion, so we could try to restrict the fallacy to threats rather than actual violence. However, threats are seldom made as reasons for believing something; instead, they are given as reasons to act, and as such can be quite good reasons to do so. The aim of a threat, typically, is to change behavior, not belief. People are often intimidated into pretending to believe things they don't, or at least into keeping quiet about their disbelief, but this is not coming to believe something because of the fear of force.

For this reason, calling the Appeal to Force a "fallacy" is, if anything, too weak. At least a fallacious argument is an *attempt* to reason, albeit a failed one. To resort to force or threats when the burden of proof is on one is not to fail to reason well, but to fail to reason at all.

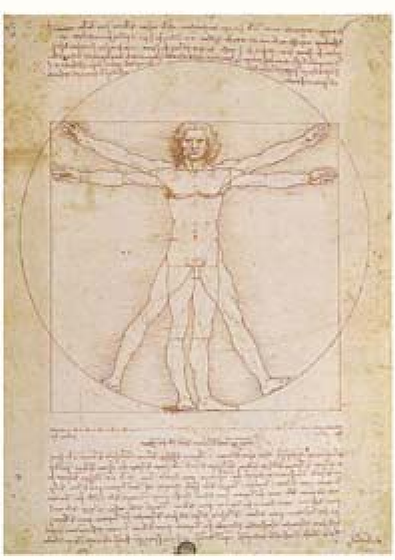
Source:

David Hackett Fischer, *Historians' Fallacies: Toward a Logic of Historical Thought* (Harper & Row, 1970), pp. 294-296.

Resource:

John Woods, "Appeal to Force", from *Fallacies: Classical and Contemporary Readings*, edited by Hans V. Hanson and Robert C. Pinto (Penn State Press, 1995), pp. 240-250.

Argumentum ad Hominem



Translation: "Argument against the man", *Latin*

Alias: The Fallacy of Personal Attack

Type: Genetic Fallacy

Exposition:

A debater commits the Ad Hominem Fallacy when he introduces irrelevant personal premises about his opponent. Such red herrings may successfully distract the opponent or the audience from the topic of the debate.

Exposure:

Ad Hominem is the most familiar of informal fallacies, and —with the possible exception of Undistributed Middle—the most familiar logical fallacy of them all. It is also one of the most used and abused of fallacies, and both justified and unjustified accusations of Ad Hominem abound in any debate.

The phrase "ad hominem argument" is sometimes used to refer to a very different type of argument, namely, one that uses premises accepted by the opposition to argue for a position. In other words, if you are trying to convince someone of something, using premises that the person accepts—whether or not you believe them yourself. This is not necessarily a fallacious argument, and is often rhetorically effective.

Subfallacies:

- **Abusive:** An Abusive Ad Hominem occurs when an attack on the character or other irrelevant personal qualities of the opposition—such as appearance—is offered as evidence against her position. Such attacks are often effective distractions ("red herrings"), because the opponent feels it necessary to defend herself, thus being distracted from the topic of the debate.
- **Circumstantial:** A Circumstantial Ad Hominem is one in which some irrelevant personal circumstance surrounding the opponent is offered as evidence against the opponent's position. This fallacy is often introduced by phrases such as: "Of course, that's what you'd expect him to say." The fallacy claims that the only reason why he argues as he does is because of personal circumstances, such as standing to gain from the argument's acceptance.
  This form of the fallacy needs to be distinguished from criticisms directed at testimony, which are not fallacious, since pointing out that someone stands to gain from testifying a certain way would tend to cast doubt upon that testimony. For instance, when a celebrity endorses a product, it is usually in return for money, which lowers the evidentiary value of such an endorsement—often to nothing! In contrast, the fact that an arguer may gain in some way from an argument's acceptance does not affect the evidentiary value of the argument, for arguments can and do stand or fall on their own merits.
- Poisoning the Well
- Tu Quoque

Source:

S. Morris Engel, *With Good Reason: An Introduction to Informal Fallacies (Fifth Edition)* (St. Martin's, 1994), pp. 198-206.

Resources:

- Alan Brinton, "The *Ad Hominem*" in *Fallacies: Classical and Contemporary Readings*, edited by Hans V. Hanson and Robert C. Pinto (Penn State Press, 1995), pp. 213-222.
- Frans H. Van Eemeren & Rob Grootendoorst, "*Argumentum Ad Hominem*: A Pragma-Dialectical Case in Point" in *Fallacies: Classical and Contemporary Readings*, edited by Hans V. Hanson & Robert C. Pinto (Penn State Press, 1995), pp. 223-228.
- Douglas N. Walton, *Arguer's Position: A Pragmatic Study of Ad Hominem Attack, Criticism, Refutation, and Fallacy* (Greenwood, 1985).

Acknowledgement:

The Da Vinci sketch art print is available from AllPosters.

Appeal to Ignorance



Alias:

- Argument from Ignorance
- Argumentum ad Ignorantiam

Type: Informal Fallacy

Forms

There is no evidence against **p**. Therefore, **p**.	There is no evidence for **p**. Therefore, not-**p**.

Example:

[Joe McCarthy] announced that he had penetrated "Truman's iron curtain of secrecy" and that he proposed forthwith to present 81 cases… Cases of exactly what? "I am only giving the Senate," he said, "cases in which it is clear there is a definite Communist connection…persons whom I consider to be Communists in the State Department." … Of Case 40, he said, "I do not have much information on this except the general statement of the agency…that there is nothing in the files to disprove his Communist connections."

Source: Richard H. Rovere, *Senator Joe McCarthy* (Methuen, 1960), pp. 106-107. Cited in: Irving M. Copi, *Introduction to Logic (Fourth Edition)* (1972), p. 88.

Exposition:

An appeal to ignorance is an argument for or against a proposition on the basis of a lack of evidence against or for it. If there is positive evidence for the conclusion, then of course we have other reasons for accepting it, but a lack of evidence by itself is no evidence.

Exposure:

There are a few types of reasoning which resemble the fallacy of Appeal to Ignorance, and need to be distinguished from it:

1. Sometimes it is reasonable to argue from a lack of evidence for a proposition to the falsity of that proposition, when there is a presumption that the proposition is false. For

instance, in American criminal law there is a presumption of innocence, which means that the burden of proof is on the prosecution, and if the prosecution fails to provide evidence of guilt then the jury must conclude that the defendant is innocent. Similarly, the burden of proof is usually on a person making a new or improbable claim, and the presumption may be that such a claim is false. For instance, suppose that I claim that I was taken by flying saucer to another planet, but when challenged I can supply no evidence of this unusual trip. It would not be an Appeal to Ignorance for you to reason that, since there is no evidence that I visited another planet, therefore I probably didn't do so.

2. We sometimes have meta-knowledge—that is, knowledge about knowledge—which can justify inferring a conclusion based upon a lack of evidence. For instance, schedules—such as those for buses, trains, and airplanes—list times and locations of arrivals and departures. Such schedules usually do *not* attempt to list the times and locations when vehicles do *not* arrive or depart, since this would be highly inefficient. Instead, there is an implicit, understood assumption that such a schedule is complete, that all available vehicle departures and arrivals have been listed. Thus, we can reason using the following sort of enthymeme:
   There is no departure/arrival listed in schedule **S** for location **L** at time **T**.
   Suppressed Premise: All departures and arrivals are listed in schedule **S**.
   Therefore, there is no departure/arrival for location **L** at time **T**.
   This kind of completeness of information assumption is often called the "closed world assumption". When it is reasonable to accept this assumption—as with plane or bus schedules—it is not a fallacy of appeal to ignorance to reason this way.
3. Another type of reasoning is called "auto-epistemic" ("self-knowing") because it involves reasoning from premises about what one knows and what one *would* know if something were true. The form of such reasoning is:
   If **p** were true, then I would know that **p**.
   I don't know that **p**.
   Therefore, **p** is false.
   For instance, one might reason:
   If I were adopted, then I would know about it by now.
   I don't know that I'm adopted.
   Therefore, I wasn't adopted.
   Similarly, when extensive investigation has been undertaken, it is often reasonable to infer that something is false based upon a lack of positive evidence for it. For instance, if a drug has been subjected to lengthy testing for harmful effects and none has been discovered, it is then reasonable to conclude that it is safe. Another example is:
   If there really were a large and unusual type of animal in Loch Ness, then we would have undeniable evidence of it by now.
   We don't have undeniable evidence of a large, unfamiliar animal in Loch Ness.
   Therefore, there is no such animal.
   As with reasoning using the closed world assumption, auto-epistemic reasoning does not commit the fallacy of Argument from Ignorance.

Resources:

- Jonathan E. Adler, "Open Minds and the Argument from Ignorance".

- Robert Todd Carroll, "Argument to Ignorance", *Skeptic's Dictionary*.
- S. Morris Engel, *With Good Reason: An Introduction to Informal Fallacies (Fifth Edition)* (St. Martin's, 1994), pp. 227-229.
- Eric C.W. Krabbe, "Appeal to Ignorance", in *Fallacies: Classical and Contemporary Readings*, edited by Hans V. Hanson and Robert C. Pinto (Penn State Press, 1995), pp. 251-264.
- Douglas Walton, "The Appeal to Ignorance, or *Argumentum ad Ignorantiam*", *Argumentation* 13 (1999), pp. 367-377 (PDF).

Acknowledgments: The cat in a dunce cap photograph is an art print available from AllPosters.

Fallacy Fallacy

Alias:

- Argumentum ad Logicam
- Fallacist's Fallacy

Type: Bad Reasons Fallacy

Form:

Argument **A** for the conclusion **C** is fallacious.
Therefore, **C** is false.

Exposition:

Like anything else, the concept of logical fallacy can be misunderstood and misused, and can even become a source of fallacious reasoning. To say that an argument is fallacious is to claim that there is no sufficiently strong logical connection between the premises and the conclusion. This says nothing about the truth-value of the conclusion, so it is unwarranted to conclude that a proposition is false simply because some argument for it is fallacious.

It's easy to come up with fallacious arguments for any proposition, whatever its truth-value. What's hard is to find a cogent argument for a proposition, even when it's true. For example, it is now believed by mathematicians that the proposition known as "Fermat's last theorem" is true, yet it took over a century for anyone to prove it. In the meantime, many invalid arguments were presented for it.

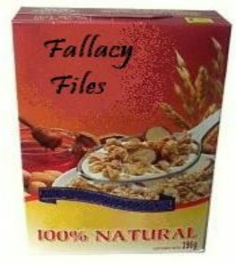
Exposure:

It is reasonable to, at least provisionally, reject an improbable proposition for which *no* adequate evidence has been presented. So, if you can show that *all* of the common arguments for a certain proposition are fallacious, and the burden of proof is on the proposition's proponents, then you do not commit this fallacy by rejecting that proposition. Rather, the fallacy is committed when you jump to the conclusion that just because *one* argument for it is fallacious, no cogent argument for it can exist.

Source:

David Hackett Fischer, *Historians' Fallacies: Toward a Logic of Historical Thought* (Harper & Row, 1970), pp. 305-306.

Appeal to Nature



Alias:

- Argumentum ad Naturam
- Naturalistic Fallacy (see Exposure)

Types:

- Loaded Words
- Sweeping Generalization
- Vagueness

Forms:

N is natural. Therefore, **N** is right or good.	**U** is unnatural. Therefore, **U** is wrong or bad.

Quote…

…[C]onsider the…argument that what is natural is somehow good and what is unnatural bad. … [T]he principle is rarely stated so explicitly, but if we look at what people actually do, this does seem to be an assumption that underlies people's behaviour. Consider, for example, the popularity of 'natural' remedies. A great many people would always prefer to take a 'natural' remedy over an 'artificial' one. Similarly, people prefer foods that have 'all natural' ingredients. One obvious point to make here is that this very characterization of certain things as 'natural' is problematic. What always strikes me about health food shops are the rows and rows of bottles and tablets. A greengrocer seems to be a much better source of natural products than such collections of distilled essences and the like. …

However, let us set aside such doubts about the category of 'the natural' for the moment and just ask, even if we can agree that some things are natural and some are not, what follows from this? The answer is: nothing. There is no factual reason to suppose that what is natural is good (or at least better) and what is unnatural is bad (or at least worse).

…Unquote

Source: Julian Baggini, *Making Sense*, Oxford, 2002, pp. 181-182.

Example:

Segregation is a natural instinct of all animals (including man).

Source: Hubert Eaton in a speech in 1964 defending racial segregation, cited in Morris Kominsky's *The Hoaxers* (Branden Press: 1970), p. 103.

Exposition:

What is logically wrong with appealing to nature? One problem is that the concept of the natural is vague. For instance, is the human use of fire "natural"? Maybe, maybe not. Is it "natural" for people to wear clothes? Yes and no. The vagueness of the notion of naturalness does not mean that it is useless, since there are many clearcut cases of the natural and the unnatural. However, an appeal to nature which is based on a borderline case will be unsound because it will be unclear whether its premise is true or false.

Another problem is that the word "natural" is loaded with a positive evaluation, much like the word "normal". So, to call something "natural" is not simply to describe it, but to praise it. This explains why it sometimes sounds odd to call some things "natural" or "unnatural". For instance, it is unnatural to wear shoes, but few would wish to condemn the practice. For this reason, to call something "natural" and then to conclude that it is, therefore, good may beg the question. Nonetheless, one may still feel that there is *some*thing right about some appeals to nature. For instance, a diet rich in natural foods—such as fruits, vegetables, and whole grains—is probably better than one based on more artificial foods—such as candy, pastries, and sausages. Also, it seems likely that a natural lifestyle—that is, one based on a natural diet and exercise—is in general a healthier one than a sedentary life spent watching television and eating doughnuts. These forms of argument could be treated as rules of thumb which admit some exceptions, but are still reliable enough to be useful. On this view, the fact that something is either natural or unnatural would give it only the presumption of goodness or badness, and that presumption can be rebutted by contrary evidence. To ignore or dismiss such evidence would be to commit a fallacy of sweeping generalization, that is, to treat the rule of thumb as if it were an exceptionless generalization. So, at best, the appeal to nature is a useful rule of thumb in some limited areas, such as diet and lifestyle.

Exposure:

I have included the term "naturalistic fallacy" as an alias for this fallacy, though it is misleading. The term "naturalistic fallacy" was coined by the philosopher G. E. Moore, in his book *Principia Ethica*, to describe an alleged mistake in ethics: defining "good" in naturalistic terms. So, if one were to defined "good" as "natural", that would be an instance of the naturalistic fallacy, according to Moore. However, the naturalistic fallacy is a much broader error: for instance, the utilitarian definition of "good" as "the greatest happiness of the greatest number" would also commit the fallacy, since all of the terms in the definition are naturalistic. Thus, there are three reasons why the appeal to nature is not the same thing as the naturalistic fallacy:

1. The naturalistic fallacy is an alleged error in definition, not an error in argument.
2. The naturalistic fallacy is an alleged error in ethics, not in logic.
3. Defining "good" as what is natural is, at most, an instance of the naturalistic fallacy.

Sources:

- Antony Flew, *How to Think Straight* (1998), see index under "natural".
- G. E. Moore, *Principia Ethica* (Cambridge: 1962), chapter 1, section 10.

The Hitler Card

Alias: Argumentum ad Nazium

Type: Guilt by Association

Example:

[T]he ideas of ecologists about invasive species—alien species as they are often called—sound…similar to anti-immigration rhetoric. Green themes like scarcity and purity and invasion and protection all have right-wing echoes. Hitler's ideas about environmentalism came out of purity, after all.

Source: Interview of Betsy Hartmann by Fred Pearce, "The Greening of Hate", *New Scientist*, 2/20/2003

Forms

Adolf Hitler accepted idea **I**. Therefore, **I** must be wrong.	The Nazis accepted idea **I**. Therefore, **I** must be wrong.

Examples

Hitler was in favor of euthanasia. Therefore, euthanasia is wrong.	The Nazis favored eugenics. Therefore, eugenics is wrong.

Counter-Examples

Hitler was a vegetarian. Therefore, vegetarianism is wrong.	The Nazis were conservationists. Therefore, conservationism is wrong.

Exposition:

In almost every heated debate, one side or the other—often both—plays the "Hitler card", that is, criticizes their opponent's position by associating it in some way with Adolf Hitler or the Nazis in general. No one wants to be associated with Nazism because it has been so thoroughly discredited in both theory and practise, and Hitler of course was its most famous exponent. So, linking an idea with Hitler or Nazism has become a common form of argument ascribing guilt by association.

Some instances of the Hitler card are factually incorrect, or even ludicrous, in ascribing ideas to Hitler or other Nazis that they did not hold. However, from a logical point of view, even if Hitler or other Nazis did accept an idea, this historical fact alone is insufficient to discredit it.

The Hitler Card is often combined with other fallacies, for instance, a weak analogy between an opponent and Hitler, or between the opposition political group and the Nazis. A related form of fallacious analogy is that which compares an opposition's actions with the Holocaust. This is a form of the ad Nazium fallacy because it casts the opposition in the role of Nazi. Not only do such arguments assign guilt by association, but the analogy used to link the opposition's actions with the Holocaust may be superficial or question-begging.

Other arguments ad Nazium combine guilt by association with a slippery slope. For instance, it is sometimes argued that the Nazis practised euthanasia, and therefore even voluntary forms of it are a first step onto a slippery slope leading to extermination camps. Like many slippery slope arguments, this is a way of avoiding arguing directly against voluntary euthanasia, instead claiming that it may indirectly lead to something admittedly bad.

Playing the Hitler Card demonizes opponents in debate by associating them with evil, and almost always derails the discussion. People naturally resent being associated with Nazism, and are usually angered. In this way, playing the Hitler Card can be an effective distraction in a debate, causing the opponent to lose track of the argument. However, when people become convinced by guilt by association arguments that their political opponents are not just mistaken, but are as evil as Nazis, reasoned debate can give way to violence. So, playing the Hitler Card is more than just a dirty trick in debate, it is often "fighting words".

Exposure:

Germany today bans capital punishment, but the history of this ban is surprising: The government of the former West Germany adopted the ban in 1949 and it continues in effect today in the reunited Germany. The law which banned the death penalty was proposed by a politician sympathetic to the Nazi war criminals who were being executed after World War 2, and was intended to block such executions. Should the disreputable historical origins of the ban influence those Germans who today oppose capital punishment to reconsider their views? Should the ban be repealed simply because it was the brainchild of a Nazi sympathizer? Capital punishment is either right or wrong. If it is right, then the ban should be repealed, regardless of its origins; if it's wrong, then the ban should be continued, despite its origins. While the history of the origins of Germany's ban on capital punishment is interesting, it is irrelevant to the moral and legal question of whether the ban should continue. Those Germans who support capital punishment should resist the temptation to play the Hitler card.

Source:

Charles Lane, "The Paradoxes of a Death Penalty Stance", *Washington Post*, 6/4/2005

Resources:

- Josie Appleton, "I'm right because...you're a Nazi", *Spiked*, 1/24/2002
- Nigel Warburton, *Thinking from A to Z (Second Edition)* (Routledge, 2001), "Bad Company Fallacy".
- Related *Fallacy Files* weblog entries:
  - Was Hitler an Environmentalist?, 3/9/2003
  - Playing the Hitler Card, 3/22/2003
  - Springtime for Hitler Analogies, 1/7/2004
  - Was Hitler a Vegetarian?, 2/29/2004
  - Reader Response, 5/2/2005

Acknowledgments:

Thanks to Michael Koplow for the example. The poster for Charlie Chaplin's "The Great Dictator" is available from AllPosters.

Guilt by Association

Alias:

- Bad Company Fallacy
- The Company that You Keep Fallacy

Type: Red Herring

Example:

The al Qaeda Cheering Section

The most telling moment in last night's [State of the Union] speech came after the president noted that "key provisions of the Patriot Act are set to expire next year." In response, notes the *New York Times*, "some critics in Congress applauded enthusiastically." If Osama bin Laden watched the speech, one imagines him applauding too.

Source: James Taranto, "The al Qaeda Cheering Section", *Best of the Web Today*, 1/21/2004

Analysis

General Form

Target	Link	Bad Thing
The person or group	An idea that the Target shares	A person or group of which the

being criticized	with the Bad Thing	argument's audience disapproves

Specific Forms

Person **P** accepts idea **I**. Therefore, **I** must be wrong.	Group **G** accepts idea **I**. Therefore, **I** must be wrong.

Examples

Hitler was in favor of euthanasia. Therefore, euthanasia is wrong.	The Nazis favored eugenics. Therefore, eugenics is wrong.

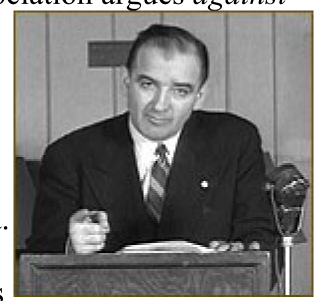
Counter-Examples

Hitler was a vegetarian. Therefore, vegetarianism is wrong.	The Nazis were conservationists. Therefore, conservationism is wrong.

Exposition:

Guilt by Association is the attempt to discredit an idea based upon disfavored people or groups associated with it. This is the reverse of an Appeal to Misleading Authority, and might be justly called "Appeal to Anti-Authority". An argument to authority argues *in favor* of an idea based upon associating an authority figure with the idea, whereas Guilt by Association argues *against* an idea based upon associating it with disreputable people or groups.

Exposure:



McCarthyism was a specific version of Guilt by Association in which an individual, organization, or idea was associated in some way with communism. An association was made between the target of McCarthyism and communism by linking both through some shared idea. For instance, in the 1960s some anti-communists attacked support for civil rights by pointing out that the Communist Party of the United States also supported the civil rights movement. It was then argued that anyone who supported civil rights was thereby supporting communism, whether they intended to or not. Here is the form of the argument:

Target	Link	Bad Thing
Martin Luther King, Jr.	Support for civil rights	Communism

This can be reformulated as a categorical syllogism as follows:
All communists are civil rights supporters.
Martin Luther King, Jr. is a civil rights supporter.
Therefore, Martin Luther King, Jr. is a communist.
This argument commits a syllogistic fallacy, and many other instances of Guilt by Association commit the same fallacy.

Subfallacy: Hitler Card

Analysis of the Example:

That Osama bin Laden might approve of the expiration of provisions of the Patriot Act does not show that American critics are wrong to also approve, since the reasons for their approval are different. Some Americans oppose parts of the Patriot Act because they believe that it infringes upon the rights of Americans without significantly helping to prevent terrorism. They may be wrong, but that doesn't make them an al Qaeda cheering squad.

Reader Response:

Reader Dale Liop writes in response to the above analysis:
It seems to me the author's point is not that the critics are wrong just because Osama bin Laden might be applauding with them. Rather, I think his implicit point is that by removing the Patriot Act, terrorists like Osama bin Laden will be able to commit crimes of terrorism more easily. For this reason, the author is saying, Osama bin laden would be clapping too, and so that's why the critics are mistaken in their position. I think calling the critics the al Qaeda Cheering Squad and mentioning bin Laden would applaud with them was for rhetorical effect only, to make his point come across more effectively. So, I do not think the author commits a fallacy because the association between bin Laden and the critics is not his real point.
Dale, in logically analyzing an example, it is important to focus upon the argument itself and not the arguer. It is not a good idea to try to read the arguer's mind, or guess his intentions. There are many reasons why an arguer may commit a fallacy: he may be mistaken, he may intend to deceive his audience, or he may be making a joke.
Another reason is a type of rhetorical overstatement: for instance, a person who is hungry may say "I'm starving!" What the person says is literally false, and they know that it's false, but they're not lying because they're not trying to deceive. Rather, they are emphasizing that they are very hungry. Similarly, people may fallaciously draw extreme conclusions that are not supported by the evidence as a way of emphasizing a point.
So, evaluating an argument as fallacious is not a judgment pronounced upon its author, but simply a judgment of the argument itself. In the example, Taranto may well have been joking or using rhetorical overstatement when he called the applauders an al Qaeda cheering squad, but that doesn't make the implicit argument—that because the applauders and bin Laden are both against the Patriot Act, then the applauders must be for al Qaeda—any less fallacious.

Source:

T. Edward Damer, *Attacking Faulty Reasoning: A Practical Guide to Fallacy-Free Arguments (Third Edition)* (Wadsworth, 1995), pp. 54-56.

Resources:

- Dr. Michael C. Labossiere, "Guilt by Association"
- Neil Munro, "Dangerous Word Games", *National Review Online*
  An exposé of the use of guilt by association in recent political rhetoric.

Bad Reasons Fallacy

Type: Formal Fallacy

Form:

Argument **A** for the conclusion **C** is unsound.
Therefore, **C** is false.

Exposition:

This fallacy consists in arguing that a conclusion is false because an argument given for it is bad. It is most likely to occur in the course of a debate, when one side argues badly for the truth of a proposition, and the other side uses the bad argument as a reason to conclude that the proposition is false. It is always tempting, in the heat of debate, to think that one has established one's own case when all that one has succeeded in doing is undermining the opposition's case. To commit the Bad Reasons Fallacy is to act as though argumentation is a zero-sum game in which, if the other side loses, then you win.

Exposure:
Since there are two ways that an argument can be unsound, there are two versions of this fallacy:

- Argument **A** has a false premise. If an argument has a false premise, then even if it is valid, it fails to prove its conclusion. However, this does not show that the conclusion is false, as it is possible to give false premises for a true conclusion.
- Argument **A** is invalid. If an argument is invalid, then even if its premises are true, it fails to prove its conclusion. However, this does not show that the conclusion is false, for it is possible to argue invalidly for a true conclusion.

It is tempting to think that the relation between the unsoundness of an argument and the falsity of its conclusion parallels the relation between the soundness of an argument and the truth of its conclusion. The conclusion of a sound argument is always true; however, the conclusion of an unsound argument may have either truth-value. Misunderstanding this asymmetry is one psychological source of this fallacy.

In some cases, such as legal trials, where there is a presumption and a corresponding burden of proof, it is legitimate to reason that a proposition is false if *all* of the reasons given for it are bad. For instance, in a criminal trial in which there is a presumption of innocence, the jury should conclude that the defendant is innocent if *all* of the prosecution's arguments for guilt are unsound. However, it would still be fallacious to conclude that the proposition is false just because *one* argument for it is unsound, unless it is the *only* argument.

Subfallacy: Fallacy Fallacy

Source:
Nigel Warburton, *Thinking from A to Z (Second Edition)* (Routledge, 2001), pp. 25-26.

Slippery Slope

Alias:

- Argument of the Beard
- Fallacy of the Beard

Quote…
…[I]f once a man indulges himself in murder, very soon he comes to think little of robbing; and from robbing he comes next to drinking and Sabbath-breaking, and from that to incivility and procrastination. Once begin upon this downward path, you never know where you are to stop. Many a man has dated his ruin from some murder or other that perhaps he thought little of at the time.

…Unquote

Source: Thomas De Quincey, "Second Paper on Murder"

Exposition:
There are two types of fallacy referred to as "slippery slopes":

1. **Causal Version:**
   Type:
   Non Causa Pro Causa
   Form:
   If **A** happens, then by a gradual series of small steps through **B**, **C**,…, **X**, **Y**, eventually **Z** will happen, too.
   Z should not happen.
   Therefore, **A** should not happen, either.

Example:
If today you can take a thing like evolution and make it a crime to teach it in the public school, tomorrow you can make it a crime to teach it in the private schools, and the next year you can make it a crime to teach it to the hustings or in the church. At the next session you may ban books and the newspapers. Soon you may set Catholic against Protestant and Protestant against Protestant, and try to foist your own religion upon the minds of men. If you can do one you can do the other. Ignorance and fanaticism is ever busy and needs feeding. Always it is feeding and gloating for more. Today it is the public school teachers, tomorrow the private. The next day the preachers and the lectures, the magazines, the books, the newspapers. After [a]while, your honor, it is the setting of man against man and creed against creed until with flying banners and beating drums we are marching backward to the glorious ages of the sixteenth century when bigots lighted fagots to burn the men who dared to bring any intelligence and enlightenment and culture to the human mind.
Source: Clarence Darrow, The Scopes Trial, Day 2
Analysis
This type is based upon the claim that a controversial type of action will lead inevitably to some admittedly bad type of action. It is the slide from **A** to **Z** via the intermediate steps **B** through **Y** that is the "slope", and the smallness of each step that makes it "slippery".
This type of argument is by no means invariably fallacious, but the strength of the argument is inversely proportional to the number of steps between **A** and **Z**, and directly proportional to the causal strength of the connections between adjacent steps. If there are many intervening steps, and the causal connections between them are weak, or even unknown, then the resulting argument will be very weak, if not downright fallacious.

2. **Semantic Version:**

Type:
Vagueness

Forms:

- **A** differs from **Z** by a continuum of insignificant changes, and there is no non-arbitrary place at which a sharp line between the two can be drawn.
  Therefore, there is really no difference between **A** and **Z**.
- **A** differs from **Z** by a continuum of insignificant changes with no non-arbitrary line between the two.
  Therefore, **A** doesn't exist.

This type plays upon the vagueness of the distinction between two terms that lie on a continuum. For instance, the concepts of "bald" and "hairy" lie at opposite ends of a spectrum of hairiness. This continuum is the "slope", and it is the lack of a non-arbitrary line between hairiness and baldness that makes it "slippery". We could, of course, decide to count, say, 10,000 hairs or less as the definition of "bald", but this would be arbitrary. Why not 10,001 or 9,999? Obviously, no answer can be given other than the fact that we prefer round numbers. However, a "round" number is one whose numeral ends in one or more zeroes, but this depends upon what base is used in the numbering system. For example, 32 is not round in the decimal (base 10) system, but is round in binary and hexadecimal (base 16). However, what base we use is a matter of convenience.

> It does not follow from the fact that there is no sharp, non-arbitrary line between "bald" and "hairy" that there really is no difference between the two. A difference in degree is still a difference, and a big enough difference in degree can amount to a difference in kind. For instance, according to the theory of evolution, the difference between species is a difference in degree.
>
> Similarly, the lack of a bright line between contrary concepts does not mean that one of the concepts is a myth—that is, there is nothing to which it refers. For example, some people have argued that there is no such thing as life, since the line between animate and inanimate thing is fuzzy. However, we can all easily identify many living things and nonliving things, and the fact that there are some things which fall into a gray area—viruses, for instance—does not mean that the concept of life is without reference.

Though these two fallacies are distinct, and the fact that they share a name is unfortunate, they often have a relationship which may justify treating them together: semantic slippery slopes often form a basis for causal slippery slopes. In other words, people often think that a causal slide from **A** to **Z** is unavoidable because there is no precise, non-arbitrary dividing line between the two concepts. For instance, opponents of abortion often believe that the legality of abortion will lead causally to the legality of infanticide, and one reason for this belief is that the only precise dividing line between an embryo and a newborn baby is the morally arbitrary one of birth. For this reason, causal slippery slopes are often the result of semantic ones.

Exposure:

A great deal of ink has been spilled in fruitless philosophical debates over exactly where to draw the line between concepts that lie on continua. This might be called the "legalistic" side of philosophy, for it is primarily in the law that we are forced to decide hard cases that lie in gray areas. For instance, if the legislature were to decide that baldness is a disability deserving of certain benefits, then the courts might be forced to decide the issue of whether a certain person is bald. In everyday life, we are seldom faced with decisions of this kind, and we continue to use the concept of baldness without worrying about borderline cases. When someone falls into the fuzzy area between bald and hairy, we just say that he is "balding", thus avoiding the issue of whether he is now bald.

One reason that so many philosophical debates are seemingly endless and undecidable is because they involve a search for a mythical entity, namely, a non-arbitrary distinction between concepts which lie upon continua in conceptual space. The logical attitude towards such problems is to avoid them if at all possible; but if a decision cannot be avoided, then draw an arbitrary line in the gray zone and stick with it. Don't be drawn into defending the decision against the charge that it is arbitrary; *of course* it's arbitary, for *any* such decision will be arbitrary. For this reason, it is not a criticism of such decisions to point out their arbitrariness. Philosophers, naturally, are uneasy about arbitrariness, but when we are dealing with conceptual continua, it is an unavoidable fact of life. Where there is only gray, there are no black-and-white distinctions to be made.

Resources:

- Julian Baggini, "Bad Moves: Slippery Slopes" A short column on the causal version of the fallacy by the editor of *The Philosophers' Magazine*.
- S. Morris Engel, *With Good Reason: An Introduction to Informal Fallacies (Fifth Edition)* (St. Martin's, 1994), pp. 170-172. Causal version.
- Geoffrey Nunberg, "Slippery Slopes", "Fresh Air" Commentary, 7/1/2003. An excellent article on both versions of the fallacy by a Stanford University linguist. As you might expect from a linguist, it discusses various ways of

referring to slippery slopes, and contains a short but useful bibliography. You can listen to the audio commentary at NPR's "Fresh Air" online site.

- Eugene Volokh & David Newman, "In Defense of the Slippery Slope" An article in PDF format on how to make causal version slippery slope arguments nonfallacious.

Reader Response:

Reader Jim Skipper writes:

I have been researching slippery slopes and wonder if you have read Eugene Volokh’s paper on the topic. Mr. Volokh demonstrates mechanisms by which slippery slope progressions take place in real world situations. While, granted, slippery slope arguments are sometimes fallacious, when dealing with people and group behavior, logic and reason seldom apply. I point this out because Mr. Volokh’s paper is very impressive and he gives a beautiful, real-world example of a slippery slope in action, in which someone assures the public that a slippery slope will not happen and then it does:

[Regarding legislation to outlaw cigarette machines.] "Sandra Starr, vice chairwoman of the Princeton Regional Health Commission…, said there is no 'slippery slope' toward a total ban on smoking in public places. 'The commission’s overriding concern,' she said, 'is access to the machines by minors.'"—New York Times, Sept. 5, 1993, § 1, at 52.

"Last month, the Princeton Regional Health Commission took a bold step to protect its citizens by enacting a ban on smoking in all public places of accommodation, including restaurants and taverns…. In doing so, Princeton has paved the way for other municipalities to institute similar bans…."—The Record (Bergen County), July 12, 2000, at L7

Not only did the PRHC slide down the slippery slope, the Record notes that it will pave the way for others to follow the same course, as we have seen throughout the United States.

Jim, I agree that Volokh's work is valuable, especially his classification of different ways in which slopes can be slippery. You'll notice that I had already included a link to his short paper in the Resources listed above, and I've added a link to the long version below.

The fact that I list the causal version of the slippery slope as a fallacy does *not* mean that every argument with the form of a slippery slope is fallacious; rather, it means that sufficiently many are fallacious to make it worth including as a type of common logical error—that is, a fallacy. However, I suspect that I'm more skeptical of the slipperiness of slopes than Volokh. While we agree that some slippery slope arguments are cogent and others are fallacious, Volokh seems to think that more are cogent than I do. One reason why I am skeptical has to do with the difficulty of the causal reasoning needed to establish that a slope really is slippery; most slippery slope arguments make little or no attempt to do this hard work. Moreover, it is difficult even in retrospect to tell whether a slippery slope mechanism has actually been at work. This brings me to the example that you cite.

In order for the cigarette machine example to show a slippery slope effect, the law banning cigarette machines must have contributed causally to the subsequent ban on smoking in public places. However, from the two newspaper quotes given, all that we know for sure is that the machine ban preceded the smoking ban. To reason that when one event precedes another the former causes the latter is to commit the post hoc fallacy.

Volokh is in fact aware of this problem, as he writes:

I would have liked to illustrate the discussion with case studies of how the legal system has slipped down various slippery slopes, but unfortunately it’s generally very hard to tell whether legal change A in fact caused legal change B (even if it’s

plausible that it did),...such case studies might therefore have become more controversial than persuasive. (p. 1039, footnote 39)

That's another thing that Volokh and I agree on!

Source: Eugene Volokh, "The Mechanisms of the Slippery Slope", *Harvard Law Review* 116 (2003), pp. 1026-1134.

Analysis of the Example:

An eloquent example of the causal slippery slope fallacy. In over seventy-five years since the Scopes trial, which Darrow lost, few if any of the horrors that he paraded before the jury have taken place.

Acknowledgment:

Thanks to Kevin Donaldson for a criticism which led to some revisions to the section on the Semantic Version of the fallacy.

Begging the Question



Alias:

- Circular Argument
- Circulus in Probando
- Petitio Principii
- Vicious Circle

Etymology:

The phrase "begging the question", or "petitio principii" in Latin, refers to the "question" in a formal debate—that is, the issue being debated. In such a debate, one side may ask the other side to concede certain points in order to speed up the proceedings. To "beg" the question is to ask that the very point at issue be conceded, which is of course illegitimate.

Type: Informal Fallacy

Form:

Any form of argument in which the conclusion occurs as one of the premises, or a chain of arguments in which the final conclusion is a premise of one of the earlier arguments in the chain. More generally, an argument begs the question when it assumes any controversial point not conceded by the other side.

Example:

To cast abortion as a solely private moral question,...is to lose touch with common sense: How human beings treat one another is practically the definition of a public moral matter. Of course, there are many private aspects of human relations, but the question whether one human being should be allowed fatally to harm another is not one of them. Abortion is an inescapably public matter.

Source: Helen M. Alvaré, *The Abortion Controversy*, Greenhaven, 1995, p. 23.

Analysis

Exposition:

Unlike most informal fallacies, Begging the Question is a validating form of argument. Moreover, if the premises of an instance of Begging the Question happen to be true, then the argument is sound. What is wrong, then, with Begging the Question?

First of all, not all circular reasoning is fallacious. Suppose, for instance, that we argue that a number of propositions, $\mathbf{p}_1, \mathbf{p}_2, \ldots, \mathbf{p}_n$ are equivalent by arguing as follows (where "$\mathbf{p} \Rightarrow \mathbf{q}$" means that **p** implies **q**):

$$\mathbf{p}_1 \Rightarrow \mathbf{p}_2 \Rightarrow \ldots \Rightarrow \mathbf{p}_n \Rightarrow \mathbf{p}_1$$

Then we have clearly argued in a circle, but this is a standard form of argument in mathematics to show that a set of propositions are all equivalent to each other. So, when is it fallacious to argue in a circle?

For an argument to have any epistemological or dialectical force, it must start from premises already known or believed by its audience, and proceed to infer a conclusion not known or believed. This, of course, rules out the worst cases of Begging the Question, when the conclusion is the very same proposition as the premise, since one cannot both believe and not believe the same thing. Any viciously circular argument is one which attempts to infer a conclusion based ultimately upon that conclusion itself. Such arguments can never advance our knowledge.

Exposure:

The phrase "begs the question" has come to be used to mean "raises the question" or "suggests the question", as in "that begs the question" followed by the question supposedly begged. The following headlines are examples:

Warm Weather Begs the Question:
To Water or Not to Water Yard Plants
Latest Internet Fracas Begs the Question:
Who's Driving the Internet Bus?
Hot Holiday Begs Big Question:
Can the Party Continue?

This is a confusing usage which is apparently based upon a literal misreading of the phrase "begs the question". It should be avoided, and must be distinguished from its use to refer to the fallacy.

Subfallacies:

- Question-Begging Analogy
- Loaded Words

Source:

S. Morris Engel, *With Good Reason: An Introduction to Informal Fallacies (Fifth Edition)* (St. Martin's, 1994), pp. 144-149

Resources:

- Julian Baggini, "Begging the Question", *Bad Moves*, 7/13/2004
- Robert Todd Carroll, "Begging the Question", *Skeptic's Dictionary*
- Douglas N. Walton, "The Essential Ingredients of the Fallacy of Begging the Question", in *Fallacies: Classical and Contemporary Readings*, edited by Hans V. Hanson and Robert C. Pinto (Penn State Press, 1995), pp. 229-239

Acknowledgements:

Thanks to Christopher Mork for a criticism which led me to revise the Form and add the Etymology. The M.C. Escher art print is available from AllPosters.

Analysis of the Example:

This argument begs the question because it assumes that abortion involves one human being fatally harming another. However, those who argue that abortion is a private matter reject this very premise. In contrast, they believe that only one human being is involved in abortion—the woman—and it is, therefore, her private decision.

Unrepresentative Sample

Alias: Biased Sample

Type: Weak Analogy

Form:

N% of sample **S** has characteristic **C**.
(Where **S** is a sample unrepresentative of the population **P**.)
Therefore, **N%** of population **P** has characteristic **C**.

Example:

The *Literary Digest*, which began its famous straw poll with the 1916 presidential campaign, mailed out millions of mock ballots for each of its surveys. …

The results that poured in during the months leading up to the [1936 presidential] election showed a landslide victory for Republican Alf Landon. In its final tabulation, the *Digest* reported that out of the more than two million ballots it had received, the incumbent, Roosevelt, had polled only about 40 percent of the straw votes. …

Within a week it was apparent that both their results and their methods were erroneous. Roosevelt was re-elected by an even greater margin than in 1932. … The *Digest*'s experience conclusively proved that no matter how massive the sample, it will produce unreliable results if the methodology is flawed.

… The mailing lists the editors used were from directories of automobile owners and telephone subscribers…[which] were clearly weighted in favor of the Republicans in 1936. People posperous enough to own cars have always tended to be somewhat more Republican than those who do not, and this was particularly true in [the] heart of the Depression.

…The sample was massive, but it was biased toward the affluent, and in 1936 many Americans voted along economic lines.

Source: Michael Wheeler, *Lies, Damn Lies, and Statistics: The Manipulation of Public Opinion in America* (Liveright, 1976), pp. 67-9.

Exposition:

This is a fallacy affecting statistical inferences, which are arguments of the following form:

N% of sample **S** has characteristic **C**.

(Where sample **S** is a subset of set **P**, the population.)

Therefore, **N%** of population **P** has characteristic **C**.

For example, suppose that an opaque bag is full of marbles, and you can win a prize by guessing the proportions of colors of the marbles in the bag. Assume, further, that you are allowed to stick your hand into the bag and withdraw one fistful of marbles before making your guess. Suppose that you pull out ten marbles, six of which are black and four of which are white. The set of all marbles in the bag is the population which you are going to guess about, and the ten marbles that you removed is the sample. You want to use the information in your sample to guess as closely as possible the proportion of colors in the bag. You might draw the following conclusions:

- 60% of the marbles in the bag are black.
- 40% of the marbles in the bag are white.

Notice that if 100% of the sampled marbles were black, say, then you could infer that *all* the marbles in the bag are black, and that *none* of them are white. Thus, the type of inference usually referred to as "induction by enumeration" is a type of statistical inference, even though it doesn't use percentages. Similarly, from the example we could just draw the vague conclusion that *most* of the marbles are black and *few* of them are white.

The strength of a statistical inference is determined by the degree to which the sample is *representative* of the population, that is, how similar in the relevant respects the sample and population are. For example, if we know in advance that *all* of the marbles in the bag are the same color, then we can conclude that the sample is perfectly representative of the color of the population—though it might not represent other aspects, such as size. When a sample perfectly represents a population, statistical inferences are actually deductive enthymemes. Otherwise, they are inductive inferences.

Moreover, since the strength of statistical inferences depend upon the *similarity* of the sample and population, they are really a species of argument from analogy, and the strength of the inference varies directly with the strength of the analogy. Thus, a statistical inference will commit the Fallacy of Unrepresentative Sample when the similarity between the sample and population is too weak to support the conclusion. There are two main ways that a sample can fail to sufficiently represent the population:

1. The sample is simply too small to represent the population, in which case the argument will commit the subfallacy of Hasty Generalization.
2. The sample is biased in some way as a result of not having been chosen randomly from the population. The Example is a famous case of such bias in a sample. It also illustrates that even a very large sample can be biased; the important thing is representativeness, not size. Small samples can be representative, and even a sample of one is sufficient in some cases.

Subfallacies:

- Hasty Generalization
- The Volvo Fallacy

Resources:

- Robert Todd Carroll, "Selection Bias", *Skeptic's Dictionary*
- David Hackett Fischer, *Historians' Fallacies: Toward a Logic of Historical Thought* (Harper & Row, 1970), pp. 104-109, "Fallacies of statistical sampling".

Black-or-White Fallacy

Alias:

- Bifurcation
- Black-and-White Fallacy
- Either/Or Fallacy
- False Dilemma

Type: Informal Fallacy

Example:

Gerda Reith is convinced that superstition can be a positive force. "It gives you a sense of control by making you think you can work out what's going to happen next," she says. "And it also makes you feel lucky. And to take a risk or to enter into a chancy situation, you really have to believe in your own luck. In that sense, it's a very useful way of thinking, because the alternative is fatalism, which is to say, 'Oh, there's nothing I can do.' At least superstition makes people do things."

Source: David Newnham, "Hostages to Fortune"

Analysis

Exposition:

The problem with this fallacy is not formal, but is found in its disjunctive—"either-or"—premise: an argument of this type is fallacious when its disjunctive premise is fallaciously supported.

Exposure:

The Black-or-White Fallacy, like Begging the Question, is a validating form of argument. For example, some instances have the validating form:

Simple Constructive Dilemma:

Either **p** or **q**.
If **p** then **r**.
If **q** then **r**.
Therefore, **r**.

For this reason, this fallacy is sometimes called "false" or "bogus" dilemma. However, these names are misleading, since not all instances have the form of a dilemma; some instead take the following, also validating form:

Disjunctive Syllogism:

Either **p** or **q**.
Not-**p**.
Therefore, **q**.

Usually, the truth-value of premises is not a question for logic, but for other sciences, or common sense. So, while an argument with a false premise is unsound, it is usually not considered fallacious. However, when a disjunctive premise is false for specifically logical reasons, or when the support for it is based upon a fallacy, then the argument commits the Black-or-White Fallacy. One such logical error is confusing contrary with contradictory propositions: of two contradictory propositions, exactly one will be true; but of two contrary propositions, *at most* one will be true, but both may be false. For example:

Contradictories

It's hot today.   It's not hot today.

Contraries

It's hot today.   It's cold today.

A disjunction whose disjuncts are contradictories is an instance of the Law of Excluded Middle, so it is logically true. For instance, "either it's hot today or it's not hot today." In contrast, a disjunction whose disjuncts are contraries is logically contingent. For example, "either it's hot today or it's cold today." If an arguer confuses the latter with the former in the premise of an argument, they commit the Black-or-White Fallacy.

Source:

S. Morris Engel, *With Good Reason: An Introduction to Informal Fallacies (Fifth Edition)* (St. Martin's, 1994), pp. 140-142.

Analysis of the Example:

Fatalism is not *the* alternative to superstition; it is *an* alternative. Superstition involves acting in ways that are ineffective, whereas fatalism involves failing to act even in situations in which our efforts can be effective. Fortunately, there are other alternatives, such as recognizing that there are some things we can control and other things we cannot, and only acting in the first case.

One-Sidedness

Alias:

- Card Stacking
- Ignoring the Counterevidence
- One-Sided Assessment
- Slanting
- Suppressed Evidence

Type: Informal Fallacy

Quote…

He who knows only his own side of the case, knows little of that. His reasons may be good, and no one may have been able to refute them. But if he is equally unable to refute the reasons on the opposite side; if he does not so much as know what they are, he has no ground for preferring either opinion.

…Unquote

Source: John Stuart Mill, *On Liberty*

Example:

You've spoke about having seen the children's prisons in Iraq. Can you describe what you saw there?

The prison in question is at the General Security Services headquarters, which was inspected by my team in Jan. 1998. It appeared to be a prison for children—toddlers up to pre-adolescents—whose only crime was to be the offspring of those who have spoken out politically against the regime of Saddam Hussein. It was a horrific scene. Actually I'm not going to describe what I saw there because what I saw was so horrible that it can be used by those who would want to promote war with Iraq, and right now I'm waging peace.

Source: Massimo Calabresi, "Scott Ritter in His Own Words", *Time*, 9/14/2002

Exposition:

A one-sided case presents only evidence favoring its conclusion, and ignores or downplays the evidence against it. In inductive reasoning, it is important to consider *all* of the available evidence before coming to a conclusion. For example, suppose that you have observed several white swans; then you might conclude:

All swans are white.

However, if you have observed even one black swan, you should not come to this conclusion. Instead, you might draw one of the weaker conclusions:

- Almost all swans are white.
- Most swans are white.
- Typically, swans are white.

So, the total evidence available to you consists in observations of several white swans and a black one. Whatever conclusion that you draw needs to be consistent with this evidence, but "all swans are white" is inconsistent with there being even one black swan. To leave the black swan out of your reasoning would be One-sidedness.

Exposure:

It is by no means always fallacious to present a one-sided argument. As is usual with fallacies, we have to take the context of the argument into consideration. For instance, a trial attorney presents a one-sided case in favor of a client. It is not a defense attorney's job to present the evidence for the defendant's guilt, rather that is the job of the prosecutor. Likewise, the prosecutor's job is to present a one-sided case for conviction. Both sides are presented in a trial, just not by the same persons. This is the way that adversarial systems, such as the legal system, work: each side presents a biased case, and the jury comes to a decision based upon hearing both sides. In this way, even though each side is slanted, all of the relevant evidence is presented by whichever side it happens to favor.

Other contexts of argumentation are similarly adversarial, for example, partisan politics such as election campaigns. A candidate's campaign will present only a positive case for the candidate's election, and a case against the candidate's opponents. However, the other side can always be relied upon to present the negative case. We voters, by listening to both sides of the campaign, can make an objective decision about how to vote based upon all the available evidence. This is why it is important to pay attention to all sides during a campaign, and to hear different political points of view. People who listen to only one side will inevitably form one-sided opinions.

Another major source of non-fallacious bias is in the world of advertising. We have no reason to expect advertisers or salespeople to tell us what is wrong with their product, or why we should buy some other manufacturer's product instead. This is why we should take such pitches with a heavy dose of skepticism. Unfortunately, all too seldom do we hear the other side of the argument, as promoters of products seem to be reluctant to criticize competitors. As rational consumers, we need to turn to consumer publications to hear the other side of the story.

One-sidedness is fallacious in contexts where we have a right to demand objectivity. Two such contexts are news stories and scientific or other scholarly writing:

- Most major American newspapers aspire to a reputation for objectivity, or fairness, on their news pages. For instance, they restrict partisan political commentary to the editorial and op-ed ("opposite the editorial") pages. News stories, of course, are not usually arguments, so it would be—strictly speaking—incorrect to accuse a biased story of committing the *fallacy* of One-sidedness. Since it isn't an argument at all, it isn't a *fallacious* argument. But slanting in a news story may lead the reader into drawing false

conclusions, which means that the story is a boobytrap, and the reader's reasoning is fallacious, albeit inadvertently.
- Scholars are expected to examine *all* of the evidence and come to a conclusion. Thus, a one-sided lack of objectivity is a cardinal scholarly sin. This is why scholars should listen to others in their field even when—in fact, *especially* when—they disagree. It is only when scholars have heard and weighed all of the evidence, and considered all of the arguments, that they can come to an objective conclusion.

Sources:

- Monroe C. Beardsley, *Thinking Straight: Principles of Reasoning for Readers and Writers* (Prentice-Hall, 1950), Section 14, pp. 77-80.
- T. Edward Damer, *Attacking Faulty Reasoning: A Practical Guide to Fallacy-Free Arguments (Third Edition)* (Wadsworth, 1995), pp. 147-149.
- Peter Suber, "The One-Sidedness Fallacy". A handout for a logic course.

Acknowledgements:

- Thanks to Mary and Marvin for asking about slanting.
- The M. C. Escher ant art print and the black swan photographic print are available from AllPosters.

Commutation of Conditionals

Alias:
- The Fallacy of the Consequent
- Converting a Conditional

Type: Fallacy of Propositional Logic

Form	Similar Validating Form (Contraposition)
If **p** then **q**. Therefore, if **q** then **p**.	If **p** then **q**. Therefore, if not-**q** then not-**p**.

Example	Counter-Example
If James was a bachelor, then he was unmarried. Therefore, if James was unmarried, then he was a bachelor.	If James was President, then he was over 35. Therefore, if James was over 35, then he was President.

Exposure:

There is an important linguistic caveat to the application of this fallacy, namely, that it is common mathematical practise to state definitions as conditional propositions, rather than *bi*conditional propositions. For instance:

A vector space **V** is *finite-dimensional* if it has a finite basis.

It would not be mistaken to infer from this definition that if a vector space is finite-dimensional then it has a finite basis.

History:

This is one of Aristotle's thirteen fallacies, from the language-independent group, also known as the "Fallacy of the Consequent". The closely-related Fallacy of Affirming the Consequent is often attributed to Aristotle, but his description of the fallacy sounds closer to commuting a conditional than affirming its consequent:

The refutation which depends upon the consequent arises because people suppose that the relation of consequence is convertible. For whenever, suppose **A** is, **B** necessarily is, they then suppose also that if **B** is, **A** necessarily is. This is also the source of the deceptions that attend opinions based on sense-perception. For people often suppose bile to be honey because honey is attended by a yellow colour: also, since after rain the ground is wet in consequence, we suppose that if the ground is wet, it has been raining; whereas that does not necessarily follow.

Sources:

- Aristotle, *On Sophistical Refutations*, 5. 167b1-8.
- Robert Audi (General Editor), *The Cambridge Dictionary of Philosophy (Second Edition)* (2001), p. 316.
- Paul Halmos, *Finite-Dimensional Vector Spaces*, Springer-Verlag, 1958, p. 10.
- Thomas P. Kiernan (Editor), *Aristotle Dictionary* (Philosophical Library, 1962), see "Consequent, Fallacy of".

Loaded Question

Alias:

- Complex Question
- Many Questions
- Plurium Interrogationum
  Translation: "many questions", *Latin*

Form:

A question with a false, disputed, or question-begging presupposition.

Example:

Why should merely cracking down on terrorism help to stop it, when that method hasn't worked in any other country? Why are we so hated in the Muslim world? What did our government do there to bring this horror home to all those innocent Americans? And why don't we learn anything, from our free press, about the gross ineptitude of our state agencies? about what's really happening in Afghanistan? about the pertinence of Central Asia's huge reserves of oil and natural gas? about the links between the Bush and the bin Laden families?

Source: Mark Crispin Miller, "Brain Drain", *Context*, No. 9

Analysis

Exposition:

A "loaded question", like a loaded gun, is a dangerous thing. A loaded question is a question with a false or questionable presupposition, and it is "loaded" with that presumption. The question *"Have you stopped beating your wife?"* presupposes that you have beaten your wife prior to its asking, as well as that you *have* a wife. If you are unmarried, or have never beaten your wife, then the question is loaded.

Since this example is a yes/no question, there are only the following two direct answers:

1. "Yes, I have stopped beating my wife", which entails "I *was* beating my wife."

2. "No, I haven't stopped beating my wife", which entails "I am *still* beating my wife."

Thus, either direct answer entails that you have beaten your wife, which is, therefore, a presupposition of the question. So, a loaded question is one which you cannot answer directly without implying a falsehood or a statement that you deny. For this reason, the proper response to such a question is not to answer it directly, but to either refuse to answer or to reject the question.

Some systems of parliamentary debate provide for "dividing the question", that is, splitting a complex question up into two or more simple questions. Such a move can be used to split the example as follows:

1. "Have you ever beaten your wife?"
2. "If so, are you still doing so?"

In this way, **1** can be answered directly by "no", and then the conditional question **2** does not arise.

Exposure:

Since a question is not an argument, simply asking a loaded question is not a *fallacious* argument. Rather, loaded questions are typically used to trick someone into implying something they did not intend. For instance, salespeople learn to ask such loaded questions as: "Will that be cash or charge?" This question gives only two alternatives, thus presuming that the potential buyer has already decided to make a purchase, which is similar to the Black-or-White Fallacy. If the potential buyer answers the question directly, he may suddenly find himself an *actual* buyer.

Resources:

- Julian Baggini, "The Fallacy of the Complex Question", *Bad Moves*
- David Hackett Fischer, *Historians' Fallacies: Toward a Logic of Historical Thought* (Harper & Row, 1970), pp. 8-9.
- Douglas Walton, *"The Fallacy of Many Questions: On the Notions of Complexity, Loadedness and Unfair Entrapment in Interrogative Theory"* This paper in PDF format is not as weighty as its title, and it contains some nice examples and interesting history of the fallacy.

Analysis of the Example:

This is a series of loaded questions and it illustrates one of the common uses of the loaded question as a rhetorical device, namely, innuendo. The questions come at the end of the article, and presuppose the following controversial claims:

- The American government did something to bring about the terrorist attacks.
- The public doesn't learn anything from the press about that government's mistakes.
- The public is not learning about what's happening in Afghanistan.
- Central Asia's oil reserves are somehow pertinent.
- There are some unspecified links between the Bush and bin Laden families.

No evidence is given in the article for any of these claims. Loaded questions are used in this way to slip claims into rhetoric without the burden of proving them, or the necessity of taking responsibility for unproven assertions.

Q&A:

Reader Steven Flintham asks the following unloaded question:

Q: "I've just been browsing your site and the page on loaded questions reminded me of something I came across ages ago without ever getting quite clear in my mind. Although it *looks* misleading, if I don't have a wife or have never beaten my wife, isn't it strictly accurate to answer

'No' to the question 'Have you stopped beating your wife?'? I haven't stopped, after all—I never even started."

A: The answer to your question turns upon an important subtlety about presupposition. Putting aside the unpleasant example of wife-beating, let's use as an example the type of question: "Have you stopped **X**ing?"—it doesn't matter what **X** is. This question is equivalent to saying: "You have stopped **X**ing: yes or no?"

Consider the contained proposition: "You have stopped **X**ing". Clearly, this means: "You have **X**ed and you are not now **X**ing." However, these two conjuncts are not equal: the first conjunct is a presupposition of the question. A presupposition to a question is a proposition which is normally known to be true before the question is asked.

Given that our example question is a yes-no question, there are two direct answers that we can give it:

1. "Yes": "I have stopped **X**ing" or, equivalently, "I have **X**ed and I am not now **X**ing." Obviously, this implies "I have **X**ed."
2. "No": "It is not the case that I have stopped **X**ing" or, equivalently, "It is not the case that both I have **X**ed and I am not now **X**ing." This implies: "Either I have not **X**ed or I am now **X**ing." In other words, there are two bases for answering "no" to the question:
    - You have never **X**ed.
    - You are now **X**ing.

So, you are right, Steven, that you could answer the loaded question "Have you stopped **X**ing?" with "No", because you have never **X**ed. However, this answer has a kind of ambiguity, since it leaves it open as to whether you are saying that you have never **X**ed or that you are still doing so. This is why it is misleading to simply answer "no" and leave it at that; one should at least say, instead: "No, I've never **X**ed so I can't very well stop."

However, since the proposition that you have **X**ed is a presupposition of the question, we normally presume that it is true or the question would not arise. This leaves as the only possible reason for denying the question that you are *still* **X**ing. This is why the second direct answer also commits you to **X**ing, though it does not logically imply it by itself. Rather, it implies it when taken together with the presupposition.

This is why loaded questions as a fallacy are sometimes classified as a type of question-begging. By loading some controversial or even false presupposition into the question, the unscrupulous questioner tries to sneak it in unchallenged.

Thanks for a difficult question, Steven!

Reader Response

Reader Doug Merritt raises the following objection:

You overlooked something important when you said, "Since a question is not an argument, simply asking a loaded question is not a fallacious argument." Loaded questions are, as you said, rhetorical devices, but in particular they are "rhetorical questions", and a rhetorical question is a form of *statement* that is merely phrased superficially as a question; it is not a true question. So I strongly disagree that a loaded question is not an argument. It is just as much of a (fallacious) argument as all the other categories in your taxonomy. This isn't merely splitting hairs; a debate can be won (in the view of the audience) by someone who does nothing at all but pose loaded questions; each serves to presume things for which no logical argument is offered, and it is very effective in practice.

Even if you're right, Doug, that a loaded question is not really a question, but is a statement, then it's still not an argument by itself. A loaded question is often a way of rhetorically making a

statement, but it is grammatically a question. You will notice that as a logical fallacy it is in a category by itself, as can be seen in the Taxonomy of Logical Fallacies. This is because Loaded Question is a fallacy of questioning, as opposed to arguing. So, I don't disagree with you that asking loaded questions can be a powerful and fallacious rhetorical trick. Rather, I simply think that fallacies involving questions should be classified as a different type of fallacy than those involving arguments. I hope eventually to add further fallacies of questioning, so that Loaded Question will no longer be in a class by itself. In the meantime, the first chapter of Fischer's book, listed in the Resources above, concerns eleven "Fallacies of Question-Framing".
Acknowledgement: The illustration is a painting by René Magritte with a superimposed question mark.

Composition

Type: Informal Fallacy

Form:

All of the parts of the object **O** have the property **P**.
Therefore, **O** has the property **P**.
(Where the property **P** is one which does not distribute from parts to a whole.)

Example:

Should we not assume that just as the eye, hand, the foot, and in general each part of the body clearly has its own proper function, so man too has some function over and above the function of his parts?
Source: Aristotle, *Nicomachean Ethics*, Martin Ostwald, translator (Bobbs-Merrill, 1962), p. 16.
Analysis

Counter-Example:

The human body is made up of cells, which are invisible.
Therefore, the body is invisible.

Exposition:

Some properties are such that, if every part of a whole has the property, then the whole will too—for example, visibility. However, not all properties are like this—for instance, invisibility. All visible objects are made up of atoms, which are too small to see. Let's call a property which distributes from all of the parts to the whole an "expansive" property, using Nelson Goodman's term. If **P** is an expansive property, then the argument form above is validating, by definition of what such a property is. However, if **P** is not expansive, then the argument form is non-validating, and any argument of that form commits the fallacy of Composition.
Sibling Fallacy: Division

Sources:

- S. Morris Engel, *Analyzing Informal Fallacies* (Prentice-Hall, 1980), pp. 25-26.
- Thomas Mautner (Editor), *A Dictionary of Philosophy* (Blackwell, 1996).

Analysis of the Example:

The function of an organ is definable in terms of what the organ does to help the whole organism to live, however, one cannot define a function for the organism as a whole in this way. For this reason, "function" is not expansive. If it were true that human beings as a whole have a function, this would be a very different notion of function than that of the function of a human organ. So, even in this case, Aristotle's argument would commit a fallacy, though a different one, namely, Equivocation.

Hasty Generalization

Alias: Converse Accident
Type: Unrepresentative Sample

Quote…

It's a story, say, about the New York City public schools. In the first paragraph a parent, apparently picked at random, testifies that they haven't improved. Readers are clearly expected to draw conclusions from this. But it isn't clear why the individual was picked; it isn't possible to determine whether she's representative; and there's no way of knowing whether she knows what she's talking about. Calling on the individual man or woman on the street to make conclusive judgments is beneath journalistic dignity. If polls involving hundreds of people carry a cautionary note indicating a margin of error of plus-or-minus five points, what kind of consumer warning should be glued to a reporter's ad hoc poll of three or four respondents?

…Unquote

Source: Daniel Okrent, "13 Things I Meant to Write About but Never Did", *New York Times*, 5/22/2005

Example:

Of course your columnist Michele Slatalla was joking when she wrote about needing to talk with her 58-year-old mother about going into a nursing home. While I admire Slatalla's concern for her parents, and agree that as one approaches 60 it is wise to make some long-term plans, I hardly think that 58 is the right age at which to talk about a retirement home unless there are some serious health concerns. In this era, when people are living to a healthy and ripe old age, Slatalla is jumping the gun. My 85-year-old mother power-walks two miles each day, drives her car (safely), climbs stairs, does crosswords, reads the daily paper and could probably beat Slatalla at almost anything.

Source: Nancy Edwards, "Letters to the Editor", *Time*, 6/26/00.

Exposition:

This is the fallacy of generalizing about a population based upon a sample which is too small to be representative. If the population is heterogeneous, then the sample needs to be large enough to represent the population's variability. With a completely homogeneous population, a sample of one is sufficiently large, so it is impossible to put an absolute lower limit on sample size. Rather, sample size depends directly upon the variability of the population: the more heterogeneous a population, the larger the sample required. For instance, people tend to be quite variable in their political opinions, so that public opinion polls need fairly large samples to be accurate.

Exposure:

Suppose that you are cooking a pot of spaghetti, and you fish out a single strand to test for doneness. If it is done, then you conclude that all of the spaghetti in the pot is done. Here, your sample is one strand of spaghetti, and the population is the entire potful of pasta. Have you committed the Fallacy of Hasty Generalization? No.

This is a familiar type of inference that most of us engage in whenever we cook something, for instance, when we taste a pot of soup to test whether it is sufficiently seasoned by tasting a single spoonful. We don't feel it necessary to test several spoonfuls, because we have every reason to believe that the spoonful we test is representative of the whole pot of soup. In the same way, a single strand of spaghetti can be representative of a whole pot of noodles.

The reason why these kinds of inference can work is because spaghetti is mass-produced, and every noodle from the same box is virtually identical to all the others. Moreover, if we put a whole boxful of spaghetti into a pot of boiling water, we can be pretty sure that all of them are being cooked for the same amount of time and at the same rate. It is in this way that we can know that the single noodle we test is a representative noodle, that is, it is like all the other noodles in the pot in terms of doneness.

How do such inferences go wrong? Let's return to the soup example: suppose that you season the soup by sprinkling spices onto its surface, but that you forget to stir the pot. Then, if you take your test spoonful from the top of the soup, without stirring, it is unlikely that it will be representative. Instead, you are likely to get much more of the spices in that spoonful than you would get from the bottom of the pot. If you fail to notice this, and conclude from your sample that the soup is sufficiently spicy, then you will have committed the Fallacy of Hasty Generalization. You will probably be disappointed later that the soup is not flavorful enough. This is why we stir a pot of soup after seasoning it, and before tasting it, so that the spices will be evenly distributed throughout the liquid, and a single spoonful will be representative of the entire pot.

When we are dealing with populations that are more variable than soup or spaghetti, we need to be not only careful how we take the sample, but we have to take a sample that is big enough to represent the variability of the population. If we are polling people's political views, then a sample of just one person is guaranteed to be misleading, no matter what opinions that person has. A hasty generalization occurs anytime the sample is not big enough to represent the population.

Source:

S. Morris Engel, *With Good Reason: An Introduction to Informal Fallacies (Fifth Edition)* (St. Martin's, 1994), pp. 137-140.

Resource:

Douglas Walton, *"Rethinking the Fallacy of Hasty Generalization"* A technical paper in PDF format.

Cum Hoc, Ergo Propter Hoc

Translation: "With this, therefore because of this", *Latin*

Type: Non Causa Pro Causa

Quote…

Near-perfect correlations exist between the death rate in Hyderabad, India, from 1911 to 1919, and variations in the membership of the International Association of Machinists during the same period. Nobody seriously believes that there is anything more than a coincidence in that odd and insignificant fact.

…Unquote

Source: David Hackett Fischer, *Historians' Fallacies: Toward a Logic of Historical Thought* (Harper & Row, 1970), pp. 168-169.

Forms

Events **C** and **E** both happened at the same time. Therefore, **C** caused **E**.	Events of type **C** have always been accompanied by events of type **E**. Therefore, events of type **C** cause events of type **E**.

Example:

Charging that welfare causes child poverty, [Gary Bauer] cites a study showing that "the highest increases in the rate of child poverty in recent years have occurred in those states which pay the highest welfare benefits. The lowest increases—or actual decreases—in child poverty have occurred in states which restrain the level of AFDC payments."

Context

Counter-Example:

The bigger a child's shoe size, the better the child's handwriting.
Therefore, having big feet makes it easier to write.

Exposition:

Cum Hoc is the fallacy committed when one jumps to a conclusion about causation based on a correlation between two events, or types of event, which occur simultaneously. In order to avoid this fallacy, one needs to rule out other possible explanations for the correlation:

- A third event—or type of event—is the cause of the correlation.
  For instance, consider the **Counter-Example**: Children's shoe sizes will be positively correlated with many developmental changes, because they are the common effects of growth. As children grow, so do their feet, and their shoe sizes increase, their handwriting improves, and they develop in many other ways. So, growth is the common cause of both increased shoe size and improved handwriting in children.
- The direction of causation may be the reverse of that in the conclusion.
  For instance, suppose that statistics show a positive correlation between gun ownership and violent crime, namely, the higher number of guns owned, the higher the rate of violent crime. It would be tempting to jump to the conclusion that gun ownership causes violent crime, but the causal relationship may be the exact reverse. High rates of violent crime may cause fearful citizens to purchase guns for protection.
  This type of error is what distinguishes *cum hoc* from its better known sibling *post hoc*. In a *post hoc* fallacy, the supposed cause temporally precedes the alleged effect, so there is no possibility that the causal relationship is the reverse.
- The correlation may simply be coincidence.
  Statistical lore is filled with examples of coincidental correlations, for example see the Quote-Unquote.

Sibling Fallacy: Post Hoc, Ergo Propter Hoc

Source:

David Hackett Fischer, *Historians' Fallacies: Toward a Logic of Historical Thought* (Harper & Row, 1970), pp. 167-169.

Context of the Example:

Bauer uses specious statistical studies to discredit the welfare system. … But this study by two Ohio State University sociologists overlooked the fact that median income declined or was flat in the ten states where welfare costs and child poverty rose, while income rose substantially in nine of the ten states where welfare payments and poverty showed the least increase. The data showed that economic decline caused an increase in both welfare and child poverty.

Source: John B. Judis, "The Mouse That Roars", *The New Republic*, August 3rd, 1987, p. 25.

Denying the Antecedent

Alias: Denial of the Antecedent

Type: Fallacy of Propositional Logic

Form	Similar Validating Forms	
	Modus Ponens	**Modus Tollens**
If **p** then **q**. Not-**p**. Therefore, not-**q**.	If **p** then **q**. **p**. Therefore, **q**.	If **p** then **q**. Not-**q**. Therefore, not-**p**.

Example:

…I want to list seventeen summary statements which, if true, provide abundant reason why the reader should reject evolution and accept special creation as his basic world-view. …
14. Belief in evolution is a necessary component of atheism, pantheism, and all other systems that reject the sovereign authority of an omnipotent personal God.
Source: Henry M. Morris, *The Remarkable Birth of Planet Earth*, (Creation-Life Publishers, 1972), pp. vi-vii.
Analysis

Counter-Example:

If it's raining, then the streets are wet.
It isn't raining.
Therefore, the streets aren't wet.

Exposition:

Together with Affirming the Consequent, this is a fallacy which involves either confusion about the direction of a conditional relation, or a confusing of a conditional with a biconditional proposition. Specifically, Denying the Antecedent occurs when a premise of an argument denies the truth of the antecedent of a conditional premise, then concludes by denying the truth of the conditional premise' consequent (see the **Form**). This form of argument is non-validating because, from the fact that a sufficient condition for a proposition is false one cannot validly conclude the proposition's falsity, since there may another sufficient condition which is true. For instance, from the fact that it isn't raining, we cannot infer with certainty that the streets are not wet, since they may have been recently washed (see the **Counter-Example**).
Sibling Fallacy: Affirming the Consequent

Source:

A. R. Lacey, *Dictionary of Philosophy (Third Revised Edition)* (Barnes & Noble, 1996).

Analysis of the Example:

To say that **q** is a "necessary component" of **p** is to mean that if one has **p** one must also have **q**, that is: "if **p** then **q**". For example, "an engine is a necessary component of a functioning automobile" means that if one has a functioning car then one has an engine, rather than if one has an engine then one has a functioning car. So, Morris' argument is as follows:
If atheism/pantheism is true then evolution is true.
Atheism/pantheism is false.
Therefore, evolution is false.
Even if the first premise were true—which it is not—it doesn't follow from a rejection of atheism or pantheism that one must reject evolution. There are many theistic religions which accept evolution as an historical fact.

Denying a Conjunct

Alias: The Fallacy of the Disjunctive Syllogism
Type: Fallacy of Propositional Logic

Forms

Not both **p** and **q**. Not **p**. Therefore, **q**.	Not both **p** and **q**. Not **q**. Therefore, **p**.

Similar Validating Forms (Conjunctive Argument)

Not both **p** and **q**. **p**. Therefore, not **q**.	Not both **p** and **q**. **q**. Therefore, not **p**.

Example	Counter-Example
It isn't both sunny and overcast. It isn't sunny. Therefore, it's overcast.	It isn't both raining and snowing. It isn't raining. Therefore, it's snowing.

Exposition:

Negating a conjunction—"not both", which is sometimes abbreviated as "nand"—means that at least one of the conjuncts is false, but it leaves open the possibility that *both* conjuncts are false. So, if we know that one of the conjuncts is true, we may validly infer that the other is false (by Conjunctive Argument). In contrast, if we know that one of the conjuncts is false, we cannot validly infer from that information alone that the other is true, since it may be false as well (Denying a Conjunct).

Exposure:

Presumably, it is the similarity between these two argument forms that is the psychological source of the fallacy. However, Denying a Conjunct is likely to seem more plausible when we have independent reasons for thinking that at least one of the two conjuncts is true. Suppose that we add to Denying a Conjunct the further disjunctive premise:

Either **p** or **q**.

The resulting argument form is validating. So, when it reasonable to suppose that the corresponding premise has been suppressed, the argument will be a valid enthymeme, rather than fallacious.

Sources:

- Howard Pospesel, *Introduction to Logic: Propositional Logic (Third Edition)* (Prentice Hall, 1998), p. 67
- William L. Reese, *Dictionary of Philosophy and Religion* (Humanities, 1980).

Division

Type: Informal Fallacy

Form:

The object **O** has the property **P**.
Therefore, all of the parts of **O** have the property **P**.
(Where the property **P** is one which does not distribute from a whole to its parts.)

Example:

The universe has existed for fifteen billion years.
The universe is made out of molecules.
Therefore, each of the molecules in the universe has existed for fifteen billion years.

Counter-Example:

People are made out of atoms.
People are visible.
Therefore, atoms are visible.

Exposition:

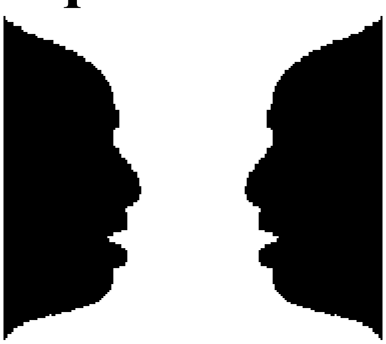
Some properties are such that, if a whole object has the property, then all of its parts will, too—for example, invisibility. However, not all properties are like this—for instance, visibility. Let's call a property which distributes from a whole object to each of its parts a "dissective" property, using Nelson Goodman's term. If **P** is a dissective property, then the argument form above is validating, by definition of what such a property is. However, if **P** is not dissective, then the argument form is non-validating, and any argument of that form commits the fallacy of Division.

Sibling Fallacy: Composition

Source:

Thomas Mautner (Editor), *A Dictionary of Philosophy* (Blackwell, 1996).

Equivocation



Alias: Doublespeak
Type: Ambiguity

Example:

The elements of the moral argument on the status of unborn life…strongly favor the conclusion that this unborn segment of humanity has a right not to be killed, at least. Without laying out all

the evidence here, it is fair to conclude from medicine that the humanity of the life growing in a mother's womb is undeniable and, in itself, a powerful reason for treating the unborn with respect.

Source: Helen M. Alvaré, *The Abortion Controversy* (Greenhaven, 1995), p. 24.

Analysis

Counter-Example:

The humanity of the patient's appendix is medically undeniable.

Therefore, the appendix has a right to life and should not be surgically removed.

Exposition:

Equivocation is the type of ambiguity which occurs when a single word or phrase is ambiguous, and this ambiguity is not grammatical but lexical. So, when a phrase equivocates, it is not due to grammar, but to the phrase as a whole having two distinct meanings.

Of course, most words are ambiguous, but context usually makes a univocal meaning clear. Also, equivocation alone is not fallacious, though it *is* a linguistic boobytrap which can trip people into committing a fallacy. The *Fallacy* of Equivocation occurs when an equivocal word or phrase makes an unsound argument appear sound. Consider the following example:

All banks are beside rivers.

Therefore, the financial institution where I deposit my money is beside a river.

In this argument, there are two unrelated meanings of the word "bank":

1. *A riverside*: In this sense, the premise is true but the argument is invalid, so it's unsound.
2. *A type of financial institution*: On this meaning, the argument is valid, but the premise is false, thus the argument is again unsound.

In either case, the argument is unsound. Therefore, no argument which commits the fallacy of Equivocation is sound.

Funny Fallacy:

Newspaper headline:

Lack of Brains Hinders Research

Source: Bob Levey, "Headlines That You Just Have to Hang On To", *The Washington Post*, 11/22/2002, p. C08.

This headline is a humorous boobytrap because the word "brains" has two meanings: the organ inside the skull, or the intelligence associated with that organ.

Subfallacy: Ambiguous Middle

Sources:

- S. Morris Engel, *With Good Reason: An Introduction to Informal Fallacies (Fifth Edition)*, St. Martin's, 1994.
- Lawrence H. Powers, "Equivocation", in *Fallacies: Classical and Contemporary Readings*, edited by Hans V. Hanson and Robert C. Pinto, Penn State Press, 1995, pp. 287-301.

Resources:

- Abbott & Costello, *"Who's On First?"*
  - Listen to the classic comedy sketch.
  - Read the classic comedy sketch.
- Headlines: Equivocation
  Humorous Headlines Torn from Today's Newspapers

Analysis of the Example:

This argument equivocates on the word "humanity"—"the condition of being human"—which means "of, … or characteristic of mankind" (*The Random House College Dictionary*, Revised Edition, 1975). The two relevant meanings here are:

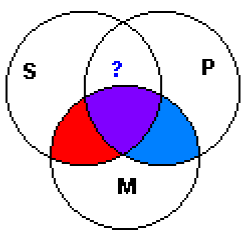
1. "of…mankind", meaning being a member of the human species.
2. "characteristic of mankind". For instance, the "*human* heart" is "human" in this sense, since it is not a human being, but is the kind of heart characteristic of human beings.

Applying this to Alvaré's argument, it is true that the "humanity" of an embryo or fetus is medically undeniable, in the second sense of "human"—that is, it is a "*human* embryo or fetus". It is, however, an equivocation on "human" to conclude, as Alvaré did, that it "has a right not to be killed". Parts of the human body are "human" in this sense, but it is only a whole human being who has a right to life.

Exclusive Premises

Alias: Two Negative Premises
Type: Syllogistic Fallacy
Form: Any form of categorical syllogism with two negative premises.

Example	Counter-Example
No moslems are christians. No jews are moslems. Therefore, no jews are christians.	No reptiles are mammals. No dogs are reptiles. Therefore, no dogs are mammals.



Venn Diagram:

This diagram represents both the **Example** and **Counter-Example**, which it shows to be invalid, since the area with the question mark is not shown to be empty.

Syllogistic Rule Violated:

At least one premise of a valid categorical syllogism is affirmative.

Source:

Robert Audi (General Editor), *The Cambridge Dictionary of Philosophy*, 1995, p. 272.

Existential Fallacy

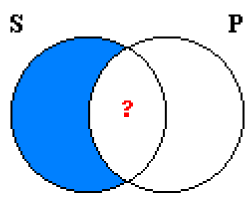


Alias: The Fallacy of Existential Assumption
Type: Quantificational Fallacy

Form:

Any argument whose conclusion implies that a class has at least one member, but whose premises do not so imply.

Example	Counter-Example
All trespassers will be prosecuted. Therefore, some of those prosecuted will have trespassed.	All unicorns are animals. Therefore, some animals are unicorns.



Venn Diagram:

This diagram represents both the **Example** and **Counter-Example**, which it shows to be invalid, since the area with the question mark would be empty if the class **S** were empty.

Exposition:

A proposition has *existential import* if it implies that some class is not empty, that is, that there is at least one member of the class. For example:

Existential Import	No Existential Import
There are black swans.	There are no Sasquatch.

To reason from premises that lack existential import for a certain class to a conclusion that has it is to commit the Existential Fallacy.

History:

In the traditional formal logic developed by Aristotle and subsequent logicians through the Middle Ages, it was implicitly assumed that the classes of things referred to by the subject and predicate terms of categorical propositions were non-empty. For this reason, certain arguments

were considered valid which would not be valid if some class were empty. For example, an **A-type proposition** implies an **I-type**, and an **E-type** implies an **O-type**:

Subalternation

All Catholics are christians. Therefore, some christians are Catholics.	No atheists are christians. Therefore, some christians are not atheists.

This type of inference is called "subalternation". Unfortunately, subalternation is an invalid form of argument if one of the terms refers to an empty class, such as "unicorns"; see the **Counter-Example**.

For reasons explained in the Exposure, logicians of the nineteenth century dropped the traditional assumption of non-emptiness, and adopted what is called the "Boolean interpretation"—after logician George Boole—of universal quantifiers. Under the Boolean interpretation, **A**- and **E**-type propositions lack existential import, while both **I**- and **O**-type have it. This has the consequence that some immediate inferences—such as subalternation—and categorical syllogisms which were valid under the traditional interpretation become instances of the Existential Fallacy. Of course, as long as the relevant classes are known to be non-empty, an argument should be considered to be an enthymeme instead of an instance of this fallacy.

Exposure:

The traditional theory makes it impossible to reason about empty classes, which might seem to be a small price to pay if all that we had to give up were classes such as unicorns. However, some classes may be empty for all we know, yet we manage to reason about them all the same. For instance, there may be no extraterrestrial aliens, but we cannot even say this meaningfully in the traditional theory, let alone use the class in an argument. 

Also, consider a shopkeeper who puts up the following sign:

The shopkeeper hopes that potential thieves will reason as follows:

According to the sign, if I shoplift, I'll be prosecuted. I don't want to be prosecuted. Therefore, I'd better not shoplift in this store.

According to the traditional theory, if the sign succeeds in deterring shoplifters, then they cannot reason this way! Yet, it is partly *because* people reason this way that there are no shoplifters.

Source:

Copi and Cohen, *Introduction to Logic (Tenth Edition)* (Prentice Hall, 1998), pp. 181-184.

Fake Precision



Alias:

- False Precision
- Misplaced Precision
- Spurious Accuracy

Type: Vagueness

Quote…

Implausibly precise statistics…are often bogus. Consider a precise number that is well known to generations of parents and doctors: the normal human body temperature of 98.6 degrees Fahrenheit. Recent investigations involving millions of measurements have revealed that this number is wrong; normal human body temperature is actually 98.2 degrees Fahrenheit. The fault, however, lies not with Dr. Wunderlich's original measurements—they were averaged and sensibly rounded to the nearest degree: 37 degrees Celsius. When this temperature was converted to Fahrenheit, however, the rounding was forgotten, and 98.6 was taken to be accurate to the nearest tenth of a degree. Had the original interval between 36.5 degrees Celsius and 37.5 degrees Celsius been translated, the equivalent Fahrenheit temperatures would have ranged from 97.7 degrees to 99.5 degrees.

…Unquote

Source: John Allen Paulos, *A Mathematician Reads the Newspaper* (Anchor, 1995), p. 139.

Example:

Sometimes [a] big ado is made about a difference that is mathematically real and demonstrable but so tiny as to have no importance. … A case in point is the hullabaloo over practically nothing that was raised so effectively, and so profitably, by the Old Gold cigarette people.

It started innocently with the editor of the *Reader's Digest*, who smokes cigarettes but takes a dim view of them all the same. His magazine went to work and had a battery of laboratory folk analyze the smoke from several brands of cigarettes. The magazine published the results, giving the nicotine and whatnot content of the smoke by brands. The conclusion stated by the magazine and borne out in its detailed figures was that all the brands were virtually identical and that it didn't make any difference which one you smoked. …

But somebody spotted something. In the lists of almost identical amounts of poisons, one cigarette had to be at the bottom, and the one was Old Gold. …[B]ig advertisements appeared in newspapers at once in the biggest type at hand. The headlines and the copy simply said that of all cigarettes tested by this great national magazine Old Gold had the least of these undesirable things in its smoke.

Source: Darrell Huff, *How to Lie With Statistics* (W.W. Norton, 1954), Chapter 4: "Much Ado about Practically Nothing", pp. 58-59.

Analysis

Exposition:

This fallacy occurs when an argument treats information as more precise than it really is. This happens when imprecise information contained in the premises must be taken as precise in order to adequately support the conclusion.

One common effect of overly-precise numbers is that they impress some people as scientific. Many people are intimidated by math, and it is easy to awe them with meaningless numbers. In fact, overly precise numbers are not a mark of science, but of *pseudo*science. They should really lend *less*, not *more*, credibility to claims.

Exposure:

During every election, there are news stories claiming that one candidate is ahead of another based upon poll results. However, in the small print of most polls you will notice that the polling numbers have a margin of error of plus-or-minus three percentage points. This means that the poll results are really a range of possible percentages. Suppose, for instance, that the following is the result of the most recent poll:

Candidate D: 44%   Candidate R: 39%

It looks as if Candidate **D** is ahead of Candidate **R**, but the margin of error means that the range of percentages is:

Candidate D: 41-47%   Candidate R: 36-42%

In other words, Candidate **R** might actually be ahead of Candidate **D**, 42% to 41%. Because of the imprecision of most poll results, one candidate must be at least six percentage points ahead of the other to be truly in the lead.

Case Study: How to Read a Poll

Sources:

- T. Edward Damer, *Attacking Faulty Reasoning: A Practical Guide to Fallacy-Free Arguments (Third Edition)* (Wadsworth, 1995), pp. 120-122.

- David Hackett Fischer, *Historians' Fallacies: Toward a Logic of Historical Thought* (Harper & Row, 1970), pp. 61-62.

Resources:

Headlines: Misplaced Precision

Humorous Headlines Torn from Today's Newspapers

Acknowledgment:

The skull with cigarette image comes from the M.C. Escher collection at AllPosters.com.

Analysis of the Example:



Here is some historical background:

In…*P. Lorillard Co. v. FTC*, the company was charged by the FTC with making a distorted use of a *Reader's Digest* article that discussed the harmful effects of various brands of cigarettes. A laboratory had concluded that no particular brand of cigarettes was substantially more harmful than any other. A table of variations in brand characteristics was inserted in the article to show the insignificance of the differences that existed in the tar and nicotine content of the smoke produced by the various brands. The table indicated that Old Golds had less nicotine and tars, although the difference was so small as to be insignificant. Lorillard launched a national advertising campaign stressing that the *Reader's Digest* test proved that its brand was "lowest in nicotine and tars," and defended its advertising before the FTC on the ground that it had truthfully reported what had been stated in the article. In a 1950 decision, the Fourth Circuit Court of Appeals, upholding the commission's cease-and-desist order, declared that Lorillard's advertising violated the FTC Act because, by printing only a small part of the article, it created an entirely false and misleading impression. "To tell less than the whole truth is a well-known method of deception," the court ruled.

In order for the fact that Old Gold cigarettes have the lowest tar and nicotine of the tested brands to count as a good reason to smoke them instead of the others, it is necessary that the difference between Old Gold and the other cigarettes be significant. However, this is not the case, so the argument contained in the Old Gold ads committed the fallacy.

Source: Susan Wagner, *Cigarette Country: Tobacco in American History* (1971), pp. 72-72.

Weak Analogy



Alias:

- False Analogy
- Faulty Analogy
- Questionable Analogy

Type: Informal Fallacy

Form:

A is like **B**.
B has property **P**.
Therefore, **A** has property **P**.
(Where the analogy between **A** and **B** is weak.)

Example:

Efforts to ban chlordane assailed
WASHINGTON (AP)--The only exterminator in Congress told his colleagues Wednesday that it would be a short-sighted move to ban use of chlordane and related termiticides that cause cancer in laboratory animals.
Supporters of the bill, however, claimed that the Environmental Protection Agency was "dragging its feet" on a chemical that could cause 300,000 cancers in the American population in 70 years.
"This bill reminds me of legislation that ought to be introduced to outlaw automobiles" on the grounds that cars kill people, said Rep. Tom DeLay, R-Texas, who owns an exterminating business.
EPA banned use of the chemicals on crops in 1974, but permitted use against termites because the agency did not believe humans were exposed. Chlordane does not kill termites but rather drives them away.
Source: Associated Press, June 25th, 1987
Analysis

Exposition:

This is a very common fallacy, but "False Analogy", its common name, is very misleading. Analogies are neither true nor false, instead they come in degrees from near identity to extreme dissimilarity. Here are two important points about analogy:

1. No analogy is perfect, that is, there is always some difference between analogs. Otherwise, they would not be two analogous objects, but only one, and the relation would be one of identity, not analogy.
2. There is always *some* similarity between any two objects, no matter how different. For example, Lewis Carroll once posed the following nonsense riddle:
   How is a raven like a writing desk?
   The point of the riddle was that they're *not*; alike, that is. However, to Carroll's surprise, some of his readers came up with clever solutions to the supposedly unsolvable riddle, for instance:
   Because Poe wrote on both.

Some arguments from analogy are based on analogies that are so weak that the argument is too weak for the purpose to which it is put. How strong an argument needs to be depends upon the context in which it occurs, and the use that it is intended to serve. Thus, in the absence of other evidence, and as a guide to further research, even a very weak analogical argument may be

strong enough. Therefore, while the strength of an argument from analogy depends upon the strength of the analogy in its premises, it is not solely determined by that strength.

Subfallacies:

- Question-Begging Analogy
- Unrepresentative Sample

Resources:

- Julian Baggini, "False Analogies", *Bad Moves*
- David Hackett Fischer, *Historians' Fallacies: Toward a Logic of Historical Thought* (Harper & Row, 1970), Chapter IX: "Fallacies of False Analogy".

Analysis of the Example:

Representative DeLay attempts to argue against a bill banning chlordane by comparing it to a bill banning automobiles, but this analogy is very weak. Here are some of the relevant differences:

- Banning automobiles would be economically and socially disruptive in a way that banning a single pesticide would not.
- There are many alternative pesticides available to replace a banned one, but there are few modes of transportation available which could replace cars.
- Automobiles play a significant role in our society, whereas chlordane was used only to prevent termite damage to houses, which is of comparatively minor importance.

Acknowledgment:

The photographic print of the head of a raven is available from AllPosters.

Non Causa Pro Causa

Translation: "Non-cause for cause", *Latin*
Alias: False Cause
Type: Informal Fallacy

Exposition:

This is the most general fallacy of reasoning to conclusions about causality. Some authors describe it as inferring that something is the cause of something else when it isn't, an interpretation encouraged by the fallacy's names. However, inferring a false causal relation is often just a mistake, and it can be the result of reasoning which is as cogent as can be, since all reasoning to causal conclusions is ultimately inductive. Instead, to be fallacious, a causal argument must violate the canons of good reasoning about causation in some common or deceptive way. Thus, to understand causal fallacies, we must understand how causal reasoning works, and the ways in which it can go awry.

Causal conclusions can take one of two forms:

1. **Event-Level:** Sometimes we wish to know the cause of a particular event, for instance, a physician conducting a medical examination is inquiring into the cause of a particular patient's illness. Specific events are caused by other specific events, so the conclusion we aim at in this kind of causal reasoning has the form:
   Event **C** caused event **E**.
   Mistakes about event-level causation are the result of confusing coincidence with causation. Event **C** may occur at the same time as event **E**, or just before it, without being the cause of **E**. It may simply be happenstance that these two events occurred at about the

same time. In order to find the correct event that caused an effect, we must reason from a causal law, which introduces the next level of causal reasoning:

2. **Type-Level:** A causal law has the form:
   Events of type **C** cause events of type **E**.
   Here, we are not talking about a causal relation holding between two particular events, but the general causal relation holding between instances of two *types* of event. For example, when we say that smoking cigarettes causes lung cancer, we are not talking about an individual act of smoking causing a particular case of lung cancer. Rather, we mean that smoking is a type of event which causes another type of event, namely, cancer. Mistakes about type-level causation are the result of confusing correlation with causation. Two types of event may occur simultaneously, or one type always following the other type, without there being a causal relation between them. One common source of non-causal correlations between two event-types is when both are effects of a third type of event. For examples of causal fallacies, see the Subfallacies of Non Causa Pro Causa:

Subfallacies:

- Cum Hoc, Ergo Propter Hoc
- Post Hoc, Ergo Propter Hoc
- The Regression Fallacy
- Texas Sharpshooter Fallacy

Resource:

David Hackett Fischer, *Historians' Fallacies: Toward a Logic of Historical Thought* (Harper & Row, 1970), Chapter VI: "Fallacies of Causation".

Illicit Conversion

Alias: False Conversion
Type: Fallacy of Quantificational Logic

Forms

All **P** are **Q**. Therefore, all **Q** are **P**.	Some **P** are not **Q**. Therefore, some **Q** are not **P**.

Similar Validating Forms

No **P** are **Q**. Therefore, no **Q** are **P**.	Some **P** are **Q**. Therefore, some **Q** are **P**.

Examples

All communists are atheists. Therefore, all atheists are communists.	Some dogs are not pets. Therefore, some pets are not dogs.

Counter-Examples

All dogs are mammals. Therefore, all mammals are dogs.	Some mammals are not cats. Therefore, some cats are not mammals.

Exposition:

Conversion is a validating form of immediate inference for E- and I-type categorical propositions. To convert such a proposition is to switch the subject and predicate terms of the proposition, which is non-validating for the A- and O-type propositions. Hence, the fallacy of Illicit Conversion is converting an A- or O-type proposition.

Source:

Paul Edwards (Editor in Chief), *The Encyclopedia of Philosophy*, (Macmillan, 1972), Volume 3, pp. 170-1.

Formal Fallacy

Type: Logical Fallacy

Exposition:

A Formal Fallacy is a type of argument the logical form of which is non-validating, and which is either:

- Deceptive and likely to be committed, usually by having a logical form that is similar to a validating form of argument.
- Part of a system of rules such that any argument of a type which the rules can be applied to, and which commits no fallacy, thereby breaks no rules. See Syllogistic Fallacy.

The distinction between a Formal and an Informal Fallacy is that a formal fallacy is based solely on logical form, and an informal fallacy takes into account the non-logical content of the argument. This roughly parallels the distinction between deductive and non-deductive modes of reasoning. Typically, formal fallacies occur within deductive contexts, whereas informal fallacies are committed by arguments that could be at best inductively strong. However, there are exceptions to this pattern, for instance Begging the Question.

Source:

Robert Audi (General Editor), *The Cambridge Dictionary of Philosophy*, 1995.

Subfallacies:

- Bad Reasons Fallacy
- Fallacy of Modal Logic
- Fallacy of Propositional Logic
- Fallacy of Quantificational Logic
- Masked Man Fallacy
- Probabilistic Fallacy
- Syllogistic Fallacy

The Four Term Fallacy

Alias: Quaternio Terminorum

Type: Syllogistic Fallacy

Form:

A two premise argument containing four terms, which results from a validating syllogistic form by substituting two distinct terms for one variable.

Example:

No Republicans are Democrats.
All conservatives are Republicans.
Therefore, no conservatives are democrats.
Analysis

Syllogistic Rule Violated:

All valid categorical syllogisms have exactly three terms.

Exposition:

A categorical syllogism is, by definition, an argument with three categorical terms. "Term" is to be understood in a semantic sense, as opposed to the syntactic sense of "word" or "phrase". In other words, it is the meaning of the words that is important. So, two different words with the same meaning are the same term, and the same word occurring twice with different meanings is two distinct terms. An argument commits the Four Term Fallacy which appears to have the form of a validating categorical syllogism, but has four terms.

For this reason, the Four Term Fallacy differs from the other Syllogistic Fallacies, each of which involves genuine categorical syllogisms which violate one or more of the rules for syllogisms. The Four Term Fallacy, in contrast, involves arguments which fail to be categorical syllogisms because of too many terms.

Exposure:

One might wonder why there is no "Five Term" fallacy, and theoretically a form which resembles a categorical syllogism can have as many as six terms. However, an argument with so many terms would be unlikely to fool anyone into thinking that it was a categorical syllogism. Of course, this raises the question of how an argument with even one extra term could so confuse anyone.

The answer is that actual instances of the Four Term Fallacy are usually polymorphously fallacious, that is, they are also instances of Equivocation. So, the fact that the argument has four terms is concealed by an equivocation on two of the terms in the argument, when one word ambiguously means two terms. When the equivocation is on the middle term, the resulting fallacy is Ambiguous Middle Term.

Subfallacy: Ambiguous Middle Term

Sources:

- Irving Copi & Carl Cohen, *Introduction to Logic (Tenth Edition)* (Prentice Hall, 1998), pp. 274-5.
- A. R. Lacey, *Dictionary of Philosophy (Third Revised Edition)*, Barnes & Noble, 1996.

Acknowledgment: Thanks to Rob Thomas.

Analysis of the Example:

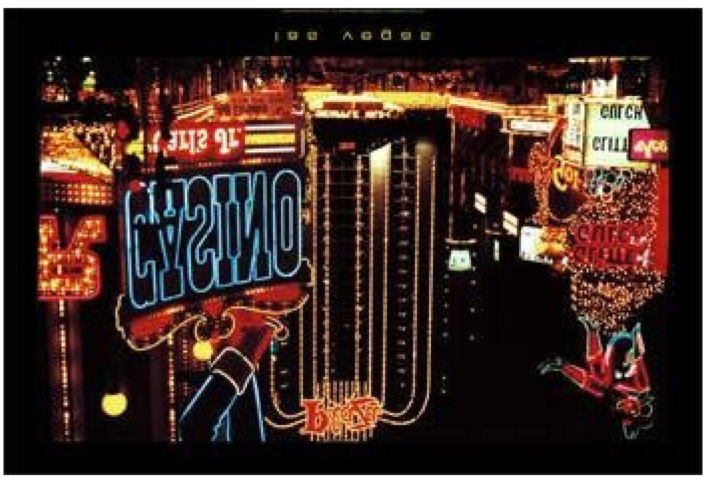
This example seems to have a validating syllogistic form, but it actually has four terms instead of three. The four terms are: conservatives, Republicans, Democrats, and democrats. The word "democrat" has two meanings when capitalized and uncapitalized:

1. A member of the **D**emocratic Party, as opposed to a member of the Republican Party. A party member may be called a "big-D" **D**emocrat to distinguish them from the second sense:
2. A supporter of democracy, as opposed to an anarchist, authoritarian, or totalitarian. These are referred to as "small-d" **d**emocrats, to distinguish them from the first sense.

In order for the example to be a genuine categorical syllogism, the two occurrences of "democrat" would have to be two occurrences of the same term, that is, they would have to have the same meaning. When two occurrences of the same word have different meanings they are

two distinct terms. The Example commits the Four Term Fallacy if the major term of the conclusion is meant in sense 2—namely, that no conservatives are small-d democrats—which is not true.

Gambler's Fallacy



Alias: The Monte Carlo Fallacy
Type: Informal Fallacy
Form:
A fair gambling device has produced a "run".
Therefore, on the next trial of the device, it is less likely than chance to continue the run.
Example:
You have flipped a fair coin and gotten a run of seven "heads" in a row.
Therefore, the chance of "tails" on the next flip is better than half.
Exposition:

The Gambler's Fallacy and it's twin, the Reverse Gambler's Fallacy, have two distinctions that no other fallacy has:

1. They have built a city in the desert: Las Vegas.
2. They are the economic mainstay of Monaco, an entire, albeit tiny, country, from which we get the alias "Monte Carlo" fallacy.

Both versions of the fallacy are based on the same mistake, namely, a failure to understand statistical independence. Two events are statistically independent when the occurrence of one has no statistical effect upon the occurrence of the other. Statistical independence is connected to the notion of randomness in the following way: what makes a sequence random is that its members are statistically independent of each other. For instance, a list of random numbers is such that one cannot predict better than chance any member of the list based upon a knowledge of the other list members.

To understand statistical independence, try the following experiment: predict the next member of each of the two following sequences:

2, 3, 5, 7, __

1, 8, 6, 7, __

The first is the beginning of the sequence of prime numbers. The second is a random sequence gathered from the last digits of the first four numbers in a phone book. The first sequence is non-random, and predictable if one knows the way in which it is generated. The second sequence is random and unpredictable—unless, of course, you look in the phone book, but that is not *prediction*, that is just looking at the sequence—because there is no underlying pattern to the sequence of last digits of telephone numbers in a phone book. The numbers in the second sequence are statistically independent.

Many gambling games are based upon randomly-generated, statistically independent sequences, such as the series of numbers generated by a roulette wheel, or by throws of unloaded dice. A fair coin produces a random sequence of "heads" or "tails", that is, each flip of the coin is statistically independent of all the other flips. This is what is meant by saying that the coin is "fair", namely, that it is not biased in such a way as to produce a predictable sequence.

Let us examine the Example: If the coin is indeed fair, then the odds of flipping a "tail" is one-half on any given flip of the coin. Also, since the coin is fair, the flips are statistically independent of one another, thus no matter how many times you have flipped "heads", the odds are unaffected. If it were possible to predict one flip from others, then the coin would not be a good randomizer.

Every gambling "system" is based on this fallacy, or its Reverse form. Any gambler who thinks that he can record the results of a roulette wheel, or the throws at a craps table, or lotto numbers, and use this information to predict future outcomes is probably committing some form of the gambler's fallacy.

Source:

A. R. Lacey, *Dictionary of Philosophy (Third Revised Edition)*, (Barnes & Noble, 1996).

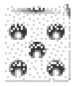
Resources:

- Julian Baggini, "The Gambler's Fallacy", *Bad Moves*, 11/19/2004
- Colin Bruce, "The Case of the Gambling Nobleman", in *Conned Again, Watson! Cautionary Tales of Logic, Math, and Probability* (Perseus, 2002). This is a Sherlock Holmes short story which explains clearly and entertainingly why the Gambler's Fallacy is fallacious.

- Robert Todd Carroll, "The Gambler's Fallacy", *Skeptic's Dictionary*.

Acknowledgment:

The Las Vegas photograph is from the collection at AllPosters.com.



The Reverse Gambler's Fallacy

Form:

A fair gambling device has produced a "run".
Therefore, on the next trial of the device, it is more likely than chance to continue the run.

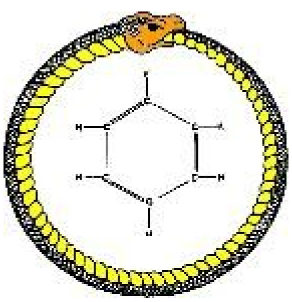
Exposition:

This fallacy is committed every day in casinos around the world, whenever a gambler thinks he's "hot" or "cold". When a gambler is on a winning streak, and keeps betting or increases his wagers in order to take advantage of his good luck; or, when a gambler stops betting because she's on a losing streak, or decreases her bets to minimize the consequences of her bad luck; both have committed the Reverse form of the gambler's fallacy. The fundamental mistake in the Reverse form is the same as in the Gambler's Fallacy, that is, the failure to appreciate statistical independence.

Exposure:

Ironically, the Gambler's and Reverse Gambler's Fallacies lead to contrary expectations about what will happen next. The former predicts that a run will tend to reverse itself, whereas the latter predicts that it will tend to continue. This means that *both* predictions cannot be true, despite the fact that many gamblers probably have committed both fallacies, even on the same day, though not at the same time. So, these two forms of argument cannot both be cogent, and in fact both are uncogent.

Genetic Fallacy



Type: Red Herring

Quote…

Difficult as it may be, it is vitally important to separate argument sources and styles from argument content. In argument the medium is *not* the message.

…Unquote

Source: Bruce N. Waller, *Critical Thinking: Consider the Verdict (Third Edition)* (Prentice Hall: 1998), p. 5.

Exposition:

The Genetic Fallacy is the most general fallacy of irrelevancy involving the origins or history of an idea. It is fallacious to either endorse or condemn an idea based on its past—rather than on its present—merits or demerits, unless its past in some way affects its present value. For instance,

the origin of evidence can be quite relevant to its evaluation, especially in historical investigations. The origin of testimony—whether first hand, hearsay, or rumor—carries weight in evaluating it.

In contrast, the value of many scientific ideas can be objectively evaluated by established techniques, so that the origin or history of the idea is irrelevant to its value. For example, the chemist Kekulé claimed to have discovered the ring structure of the benzene molecule during a dream of a snake biting its own tail. While this fact is psychologically interesting, it is neither evidence for nor against the hypothesis that benzene has a ring structure, which had to be tested for correctness.

So, the Genetic Fallacy is committed whenever an idea is evaluated based upon irrelevant history. To offer Kekulé's dream as evidence either for or against the benzene ring hypothesis would be to commit the Genetic Fallacy.

Subfallacies:

- Ad Hominem
- Appeal to Misleading Authority
- Etymological Fallacy

Resources:

- Julian Baggini, "Mental Manoeuvres: The Genetic Fallacy", *New Humanist*
- T. Edward Damer, *Attacking Faulty Reasoning: A Practical Guide to Fallacy-Free Arguments (Third Edition)* (Wadsworth, 1995), pp. 36-37.
- David Hackett Fischer, *Historians' Fallacies: Toward a Logic of Historical Thought* (Harper & Row, 1970), pp. 155-157.

Red Herring



Alias:

- Ignoratio Elenchi ("ignorance of refutation", *Latin*)
- Irrelevant Thesis

Type: Informal Fallacy

Etymology:

The name of this fallacy comes from the sport of fox hunting in which a dried, smoked herring, which is red in color, is dragged across the trail of the fox to throw the hounds off the scent. Thus, a "red herring" argument is one which distracts the audience from the issue in question through the introduction of some irrelevancy. This frequently occurs during debates when there is an at least implicit topic, yet it is easy to lose track of it. By extension, it applies to any argument in which the premises are logically irrelevant to the conclusion.

Exposition:

This is the most general fallacy of irrelevance. Any argument in which the premises are logically unrelated to the conclusion commits this fallacy.

History:

This fallacy is often known by the Latin name "Ignoratio Elenchi", which translates as "ignorance of refutation". The ignorance involved is either ignorance of the conclusion to be refuted—even deliberately *ignoring* it—or ignorance of what constitutes a refutation, so that the attempt misses the mark. This explanation goes back to Aristotle's *On Sophistical Refutations*, the focus of which is fallacious refutations in debate. As with all of Aristotle's original fallacies, its application has widened to all arguments.

Of course, fallacies of ambiguity involve irrelevance, in that the premises are logically irrelevant to the conclusion, but this fact is disguised by ambiguous language. However, Aristotle classifies Ignoratio Elenchi as language-independent, though he does say:

One might, with some violence, bring this fallacy into the group of fallacies dependent on language as well.

But this would make Ignoratio Elenchi so wide that just about every fallacy—with the exception of Begging the Question—would be a subfallacy of it. This is too wide to be useful, so I will follow Aristotle in restricting it to non-linguistic fallacies, excluding those disguised by ambiguity or vagueness.

Exposure:

Logical relevance is itself a vague and ambiguous notion. It is ambiguous in that different types of reasoning involve distinct types of relevance. It is vague in that there is little agreement among logicians about even deductive relevance, with logicians divided into different camps, so-called "relevance" logicians arguing for a more restrictive notion of logical relevance than so-called "classical" logicians.

Another ambiguity of the term "relevance" is that *logical* relevance can be confused with *psycho*logical relevance. The fact that two ideas are logically related may be one reason why one makes you think of the other, but there are other reasons, and the stream of consciousness often includes associations between ideas that are not at all logically related. Moreover, not all logical relations are obvious, so that a logical relationship may not cause a psychological relationship at all.

Because it is the most general fallacy of irrelevance, most fallacious arguments will be identified as some more specific type of irrelevancy.

Subfallacies:

- Appeal to Consequences
- Bandwagon Fallacy
- Emotional Appeal
- Genetic Fallacy
- Guilt by Association
- Straw Man
- Two Wrongs Make a Right

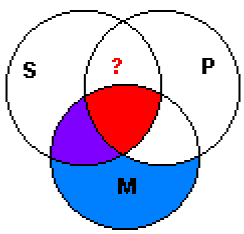
Sources:

- Aristotle, On Sophistical Refutations, Section 1, Part 5; W. A. Pickard-Cambridge, translator.
- S. Morris Engel, *Analyzing Informal Fallacies* (Prentice-Hall, 1980), pp. 95-99.

Illicit Major

Alias: Illicit Process of the Major Term
Type: Illicit Process
Form:
Any form of categorical syllogism in which the major term is distributed in the conclusion, but not in the major premise.

Example	Counter-Example
All communists are leftists. No conservatives are communists. Therefore, no conservatives are leftists.	All dogs are animals. No cats are dogs. Therefore, no cats are animals.



Venn Diagram:
This diagram represents both the **Example** and **Counter-Example**. It does not show the conclusion, "No **S** is **P**", to be true, because the area with the question mark is not shown to be empty.

Exposition:
An "illicit process of the major" is not an illegal trial of a military officer, rather it is a syllogistic fallacy in which the *major* term is undistributed in the major premise, but distributed in the conclusion, which is the "illicit process"—that is, "illicit" distribution, in the sense of breaking the rules of the categorical syllogism.

Sibling Fallacy: Illicit Minor

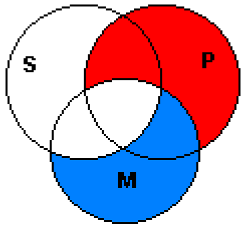
Source:
Irving Copi & Carl Cohen, *Introduction to Logic (Tenth Edition)* (Prentice Hall, 1998), pp. 276-7.

Illicit Minor

Alias: Illicit Process of the Minor Term
Type: Illicit Process
Form:
Any form of categorical syllogism in which the minor term is distributed in the conclusion but not in the minor premise.

Example	Counter-Example
All terrorists are extremists. All extremists are radicals.	All whales are mammals. All mammals are animals.

Therefore, all radicals are terrorists.	Therefore, all animals are whales.



Venn Diagram:

This diagram represents both the **Example** and **Counter-Example**. It does not show the conclusion, "All **S** is **P**", to be true, which shows that both arguments are invalid.

Exposition:

"Illicit minor" does not refer to underage drinking, but to an illicit process—that is, distribution—of the minor term in a categorical syllogism.

Sibling Fallacy: Illicit Major

Source:

Irving Copi & Carl Cohen, *Introduction to Logic (Tenth Edition)* (Prentice Hall, 1998), p. 277.

Negative Conclusion from Affirmative Premises

Alias:

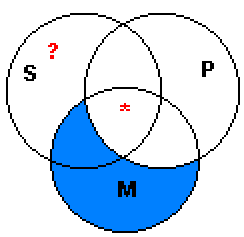
- Illicit Negative/Affirmative
- Positive Conclusion/Negative Premises

Type: Syllogistic Fallacy

Form:

Any form of categorical syllogism with a negative conclusion and affirmative premises.

Example	Counter-Example
All sound arguments are valid. Some fallacious arguments are sound. Therefore, some fallacious arguments are not valid.	All dogs are animals. Some pets are dogs. Therefore, some pets are not animals.



Venn Diagram:

This diagram shows that both the Example and Counter-Example are invalid, since it does not show that there is anything in the area with the question mark.

Syllogistic Rule Violated:

Any validating form of categorical syllogism with both premises affirmative has an affirmative conclusion.

Source:
Robert Audi (General Editor), *The Cambridge Dictionary of Philosophy (Second Edition)*, 1995, p. 272.

Illicit Process

Type: Syllogistic Fallacy

Form:
Any form of categorical syllogism in which a term which is distributed in the conclusion is undistributed in a premise.

Syllogistic Rule Violated:
In a validating form of categorical syllogism, any term that is distributed in the conclusion is distributed in the premise in which it occurs.

Exposition:
An argument with a term distributed in the conclusion, but not in its premise, commits a fallacy of Illicit Process. Since every categorical proposition has two terms, this means that there are two subfallacies of this fallacy, depending upon whether it is the major term or the minor term which is illicitly distributed.

Source:
Irving Copi & Carl Cohen, *Introduction to Logic (Tenth Edition)* (Prentice Hall, 1998), pp. 276-7.

Subfallacies:

- Illicit Major
- Illicit Minor

Quantifier-Shift Fallacy

Alias: Illicit Quantifier Shift

Type:

- Fallacy of Quantificational Logic
- Scope Fallacy

Form:
Every **P** bears the relation **R** to some **Q**.
Therefore, some **Q** bears the inverse of relation **R** to every **P**.

Similar Validating Form:
Some **Q** bears the relation **R** to every **P**.
Therefore, every **P** bears the inverse of relation **R** to some **Q**.

Example:
Every event must have a cause, that is, every event bears the effect relation to some other event, which is its cause.
Therefore, there must be a cause of every event, that is, some event bears the inverse of the effect relation—which is the cause relation—to every other event. This first cause is what we call "God".

Counter-Example:

Everybody loves someone.
Therefore, there is somebody whom everyone loves. (Lucky person!)

Exposition:

The phrase "quantifier-shift" refers to the two quantifiers at the beginning of the premise and conclusion of arguments of this form, namely, "every" and "some". "Shift" refers to the fact that the difference between the premise and conclusion of this form of argument consists in a shift in the order—or, technically, the scope—of the quantifiers. In the premise, the universal quantifier, "every", is followed by the existential one, "some", whereas in the conclusion the order is reversed. This means that in the premise the universal quantifier has widest scope, while in the conclusion the existential quantifier has wider scope.

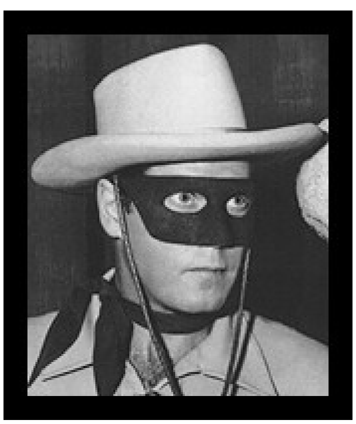
The fallaciousness of this form of argument is most easily seen by examining some counter-examples that would fool no one. For instance, everyone has a mother—that is, for every person, there is some mother of that person. However, it is false that there is a mother of us all—that is, it is not true that some woman is the mother of everyone.

The converse inference is validating (see the **Similar Validating Form**); for instance, if there was truly someone who loved everyone, then it would follow that everyone was loved by *someone*—namely, the all-lover. But it does not follow from the fact that everyone is loved by someone that there is someone who loves everyone—that is, an all-lover. The fact that these two inferences differ only in the direction in which the quantifiers are shifted is probably one psychological reason why this fallacy is so easy to commit.

Sources:

- Robert Audi (General Editor), *The Cambridge Dictionary of Philosophy (Second Edition)*, 1999, pp. 272-3.
- A. R. Lacey, *Dictionary of Philosophy (Third Revised Edition)* (Barnes & Noble, 1996).

The Masked Man Fallacy



Alias: Illicit Substitution of Identicals
Type: Formal Fallacy

Forms

a = b	**Ca** (where **C** is an intensional context).

Ca (where **C** is an intensional context).
Therefore, **Cb**.

Not-**Cb**.
Therefore, it is not the case that **a** = **b**.

Examples

The masked man is Mr. Hyde.
The witness believes that the masked man committed the crime.
Therefore, the witness believes that Mr. Hyde committed the crime.

The witness believes that the masked man committed the crime.
The witness doesn't believe that Mr. Hyde committed the crime.
Therefore, Mr. Hyde is not the masked man.

Counter-Examples

The masked man is Mr. Hyde.
The witness claims that the masked man committed the crime.
Therefore, the witness claims that Mr. Hyde committed the crime.

The witness claims that the masked man committed the crime.
The witness denies that Mr. Hyde committed the crime.
Therefore, Mr. Hyde is not the masked man.

Exposition:

Substitution of Identicals, also known as "Leibniz' Law", is a validating form of argument so long as the context in which it occurs is extensional, or referentially transparent. For instance, given that Mark Twain wrote *Huck Finn* and that Sam Clemens was the same person as Mark Twain, then Sam Clemens wrote *Huck Finn*. The context "**x** wrote *Huck Finn*" is extensional, which means that we can validly substitute identicals within it. In contrast, if Joe said "Mark Twain wrote *Huck Finn*", it does not follow that he said "Sam Clemens wrote *Huck Finn*", for he may have said no such thing.

A quoted context is an intensional—or, referentially opaque—context, as are such other contexts as:

- **Propositional attitudes**: belief, desire, fear, etc.
- **Modal contexts**: necessity, possibility, etc.

The Fallacy of Illicit Substitution of Identicals—or, more colorfully, "The Masked Man Fallacy"—is an application of Leibniz' Law within an intensional context. The most familiar uses of Substitution of Identicals are mathematical, where the contexts are always extensional. This may mislead one into thinking that substitution is valid in all contexts, but we have seen that this is not the case.

Source:

Ted Honderich (editor), *The Oxford Companion to Philosophy*, 1995.

Improper Transposition

Alias: Negating Antecedent and Consequent

Type: Fallacy of Propositional Logic

Example:

Tavis Smiley (interviewer): How are you going to respond to folks on the campaign trail when they ask what qualifies you to be the commander-in-chief given that you have not served in the country's military?
Al Sharpton (interviewee): I think that just because one served in the military does not make one a competent commander-in-chief.
Analysis

Forms	Similar Validating Forms (Transposition, Alias: Contraposition)
If **p** then **q**. Therefore, if not-**p** then not-**q**.	If **p** then **q**. Therefore, if not-**q** then not-**p**.
If not-**p** then not-**q**. Therefore, if **p** then **q**.	If not-**p** then not-**q**. Therefore, if **q** then **p**.

Example	Counter-Example
If there's a fire, then there's smoke. Therefore, if there's no fire, then there's no smoke.	If we guillotine the king, then he will die. Therefore, if we don't guillotine the king, then he won't die.

Exposition:

Improper transposition occurs when the antecedent and consequent of the conclusion of a **Transposition** are switched. This fallacy bears the same type of similarity to Denying the Antecedent as Commutation of Conditionals bears to Affirming the Consequent. Like all of these conditional fallacies, it is most plausible when the converse of the premise is also true.

Analysis of the Example:

Smiley says that some people will raise the objection: "If ['given that'] someone has not served in the military then he is not qualified to be Commander-in-Chief". This is equivalent, by *proper* transposition, to: "If someone is qualified to be Commander-in-Chief then he has served in the military." Since Sharpton had not served in the military, this would imply that he is not qualified for the Presidency, by Modus Tollens.

However, Sharpton says that he will respond to anyone who raises Smiley's objection by denying: "If ['just because'] someone has served in the military then he is qualified to be Commander-in-Chief". This is the *im*proper transposition of Smiley's objection, and is not logically equivalent to it. To see this, notice that Smiley's objection is at least plausible, for it says that military service is a necessary condition for being Commander-in-Chief. However, Sharpton denies that military service is a sufficient condition for being Commander-in-Chief, which is an easily refuted claim.

Note that the negation in Sharpton's conditional has wide scope, that is, over the entire conditional. Otherwise, the scope would be on the consequent of the conditional, producing the implausible claim: "If someone has served in the military then he is not qualified to be Commander-in-Chief".

So, Sharpton did not answer the objection raised by Smiley, but pulled a logical "bait and switch" by improperly transposing it into an easily refuted proposition. The two propositions are similar enough that most people will not realize what Sharpton has done, and it is even possible that Sharpton himself did not realize it.

Sources:

- Robert Audi (General Editor), *The Cambridge Dictionary of Philosophy (Second Edition)* (1995), p. 272.
- Paul Edwards (Editor in Chief), *The Encyclopedia of Philosophy* (Macmillan, 1972), Volume 3, p. 170.
- *The Tavis Smiley Show* Click the little loudspeaker next to Al Sharpton's name. The example begins about :58 or :59 into the interview.

Acknowledgments:

Thanks to Michael Koplow for the Sharpton example, and thanks to Mark Meyers for criticizing the original analysis of it.

Loaded Words

Alias:

- Loaded Language
- Question-Begging Epithets

Type: Begging the Question

Example:

Probably the greatest American speech of our century was Gen. Douglas MacArthur's address to Congress on his return from Korea. Search all others, read this masterpiece, and you will recall what I mean. Many men are full of good language…. But a truly great speech requires not only superb language but great wisdom and great truth at a great moment from the heart of a great man….

Gen. MacArthur wrote this speech flying in the "Bataan" from San Francisco to Washington… and in longhand…. He could compose it because he understood it. He spoke the truth because he knew it…. This speaker's great calling was liberty. Events full of terror and sorrow were at hand. Here was the needed reminder to his countrymen that the people who were in this war all the way were our men who ennoble the high, sharp Korean walls and live on Heartbreak Ridge every day. And die.

Here was prophecy as revealing as a beacon light…. Here was hope: the dedication that we will live in a world where those of us who are Americans can be proud…. Here was history tolling like an old and important bell: the mighty warning that mighty America, once having entered this major war, must not let it end in impasse….

It was all spoken in less than 30 minutes and in 3074 words.

Source: Henry J. Taylor, *San Francisco News*

Analysis

Exposition:

A word or phrase is "loaded" when it has a secondary, evaluative meaning in addition to its primary, descriptive meaning. When language is "loaded", it is loaded with its evaluative meaning. A loaded word is like a loaded gun, and its evaluative meaning is the bullet.

Examples

Unloaded	Loaded
Plant	Weed
Animal	Beast

While few words have *no* evaluative overtones, "plant" is a primarily descriptive term. "Weed", in contrast, has essentially the same descriptive meaning as "plant", but a negative evaluative meaning, as well. A weed is a plant of which we disapprove.

Loaded language is not inherently fallacious, otherwise most poetry would commit this fallacy. However, it is often a logical boobytrap, which may cause one to leap to an unwarranted evaluative conclusion. The fallacy is committed either when an arguer attempts to use loaded words in place of an argument, or when an arguee makes an evaluation based on the colorful language in which an argument is clothed, rather than on the merits of the argument itself. Loaded language is a subfallacy of Begging the Question, because to use loaded language fallaciously is to assume an evaluation that has not been proved, thereby failing to fulfill the burden of proof. For this reason, Jeremy Bentham dubbed this fallacy "Question-Begging Epithets".

Analysis of the Example:

This is an example of how a passage can consist of loaded language and little else. In reading this, we learn a lot of trivia about MacArthur's speech: that it was written in longhand on the plane "Bataan" flying from San Francisco to New York, that it was 3074 words long, and that it took less than 30 minutes to deliver. However, none of these facts has any bearing on whether that speech is "[p]robably the greatest American speech of our [20th] century". Instead, we get a lot of evaluative and loaded language, but nothing to back up the evaluation. Among the loaded words used in describing the speech are:

- "prophecy": The literal meaning of "prophecy" is "prediction", but the word is associated with religion and thus suggests a religious significance to the speech, as if MacArthur were a Biblical prophet.
- "history": MacArthur's speech is certainly of historical significance, but that does not mean that the speech itself is a great one.
- "mighty": The literal meaning is simply "powerful" or "forceful", but "mighty" is used rhetorically to suggest *good* or benevolent power.

Sources:

- Jeremy Bentham, *Bentham's Handbook of Political Fallacies*, revised, edited & with a preface by Harold A. Larrabee (Apollo, 1971), pp. 139-144.

- S. Morris Engel, *With Good Reason: An Introduction to Informal Fallacies (Fifth Edition)* (St. Martin's, 1994), pp. 149-152.
- S. I. Hayakawa, *Language in Thought and Action (Second Edition)* (Harcourt, Brace & World, 1964), p. 292.

Logical Fallacy

Exposition:

"Fallacy" is a vague and ambiguous word. First, "fallacy" is frequently used to mean a common factual error, and a number of books with it in the title—such as Tad Tuleja's *Fabulous Fallacies*—are collections of common factual mistakes, with corrections. This is not the type of fallacy catalogued in the *Fallacy Files*; rather, it is a collection of *logical* fallacies.

"Logical fallacy" shares with "factual fallacy" the genus "common error", that is, both are types of error commonly committed by people. Factual fallacies, of course, are mistakes about factual matters, whereas logical fallacies are not errors of fact, but errors of *reasoning*.

A further ambiguity in the term "logical fallacy" is that between type and instance:

1. **Type:** In this sense, a logical fallacy is a *type* of error, that is, a class of many similar instances of bad reasoning.
2. **Instance:** In this sense, a logical fallacy is an instance of bad reasoning, that is, a specific argument rather than a class of them.

Throughout the *Fallacy Files* I restrict the term "logical fallacy"—or just "fallacy", for short, since I'm not concerned here with factual mistakes—to sense 1, and not sense 2. For sense 2, I say that a particular argument "commits" a fallacy, or that it is "fallacious", which means that the argument is an instance of a fallacy, in sense 1.

Nonetheless, "fallacy" is still ambiguous because errors in reasoning are of many distinct types, and it is vague because some types of logical error are matters of degree. Roughly speaking, though, I will use the following definition:

Logical Fallacy = a common type of error in reasoning.

Subfallacies: The Taxonomy of Logical Fallacies

Resource:

Madsen Pirie, *The Book of the Fallacy: A Training Manual for Intellectual Subversives* (Routledge and Kegan Paul, 1985). This book is, unfortunately, out of print and used copies are difficult to find, but it is the only single volume that covers logical fallacies in general, that is, formal as well as informal ones.

Fallacy of Modal Logic

Type: Formal Fallacy

Exposition:

Modal logic is that branch of logic which studies logical relations involving modalities. Modalities are ways, so to speak, in which propositions can be true or false. The most commonly studied modalities are necessity and possibility, which are modalities because some propositions are necessarily true/false and others are possibly true/false. Types of modality include:

- **Alethic Modalities:** These include possibility and necessity, which were already mentioned, as well as impossibility and contingency. Some propositions are impossible, that is, necessarily false, whereas others are contingent, meaning that they are both possibly true and possibly false.
- **Temporal Modalities:** Historical and future truth or falsity. Some propositions were true/false in the past and others will be true/false in the future.
- **Deontic Modalities:** Obligation and permissibility. Some propositions ought to be true/false, while others are permissible.
- **Epistemic Modalities:** Knowledge and belief. Some propositions are known to be true/false, and others are believed to be true/false.

Most modalities are propositional functions—that is, they are functions which when applied to a proposition produce a proposition—like negation, but unlike negation in that they are not truth-functional. That is, you cannot determine the truth-value of a modal proposition based solely upon the truth-value of the proposition it contains. For instance, from the fact that a certain

proposition is true it does not follow that it is necessarily true, nor that it isn't. Some true propositions are necessary, but others are not.
Modal fallacies are formal fallacies in which modality plays a role in the fallaciousness of a type of argument.

Exposure:

Since modalities are frequent topics in philosophy—alethic modalities in metaphysics, epistemic ones in epistemology, and deontic ones in ethics—modal fallacies are quite frequent in philosophical and pseudo-philosophical argumentation. So, while students of philosophy should, of course, study logic and fallacies in general, they should pay particular attention to modal fallacies including the subfallacy below.

Subfallacy:

Modal Scope Fallacy

Resources:

- James Garson, "Modal Logic", *Stanford Encyclopedia of Philosophy*. A clear but technical survey of the field that assumes comfort with standard nonmodal logic.
- G. E. Hughes & M. J. Cresswell, *A New Introduction to Modal Logic* (Routledge, 1996). The standard introduction, which may be too much for novices.

Modal Scope Fallacy

Type:

- Fallacy of Modal Logic
- Scope Fallacy

Example:

If you know something then you cannot be mistaken. But if you cannot be mistaken, then you are certain. Thus, certainty is a necessary condition of knowledge. If you're uncertain, then you don't really know, but the only things that you can be truly certain of are logic and mathematics. Therefore, there is no knowledge of anything outside of logic and math.
Analysis

Counter-Example:

If a man is a bachelor then he cannot be married, but if he cannot be married then he must be a priest. Therefore, all bachelors are priests.

Exposition:

Modalities, like other logical concepts such as negation, have scope, that is, they logically influence a part of any sentence in which they occur. Moreover, in English grammar the scope of modalities is often ambiguous. Compare the following sentences with their modal terms highlighted:

- "If George is President, then he *must* be older than 35."
- "If God exists, then he *necessarily* exists."

Though these two propositions have different subject matter, they seem to have the same form: both appear to be conditional propositions, and the modal words—"must" and "necessarily"—in them are embedded in their consequents. However, on the most plausible interpretations, the modalities differ in scope. Here are the most plausible readings of the examples:

- "It must be the case that if George is President then he is older than 35."

In this example, "must" has broad scope over the whole conditional proposition. That is, the proposition says that it is a necessary truth that if George is President then, based upon a constitutional rule, he is older than 35. If the "must" had narrow scope, then it would say that if George is president then he is necessarily older than 35. But this is false, since no one is necessarily older than 35; that one is a certain age is a contingent fact, not a necessary one.

- "If God exists, then it is necessary that he exists."
  In this example, "necessary" has narrow scope, that is, its scope is restricted to the proposition's consequent, rather than the whole proposition. The proposition claims that *if* God does in fact exist, then His existence is a necessary one. This is a special claim about God which is not true of other things; for instance, it is thankfully not the case that if Osama bin Laden exists then he necessarily exists. If the scope of the modality were broad, then the proposition would say that it is necessarily the case that if God exists then He exists. While this is true, it is true of everything including Osama bin Laden.

In these two examples it is clear what the scope of the modality is, but in other sentences it is not clear whether the modality has a broad or narrow scope. The modal scope fallacy occurs when this amphiboly is exploited.

Analysis of the Example:

Simplified a little, the example argument is the following:

1. If you know something, then you cannot be mistaken about it.
2. If you cannot be mistaken, then you are certain.
3. Therefore, if you know something, then you are certain about it.

The scope ambiguity is found in the first premise, where the alethic modality "cannot" may have two scopes:

1. **Narrow Scope:** If you know something, then it is impossible for you to be mistaken about it.
2. **Wide Scope:** It is impossible to both know something and be mistaken about it.

The modality in the first premise must have narrow scope in order for the argument to be valid, but the modality must have wide scope in order for the premise to be obviously true. The wide scope reading is uncontroversially true: it is impossible to know a falsehood. However, the narrow scope reading is at least controversial, and probably false: knowledge does not require the impossibility of error, merely its lack.

Source:

Norman Swartz, "'The' Modal Fallacy". "*The* modal fallacy", as Swartz refers to it, is the modal scope fallacy. There are other fallacies involving modalities, but this is probably the most common one. Swartz provides many examples of the fallacy using different types of modalities. The article is moderately technical, and uses some logical symbolism without explanation.

Resources:

- Raymond Bradley & Norman Swartz, *Possible Worlds: An Introduction to Logic and Its Philosophy* (Hackett, 1979), pp. 330-332.
- Torkel Franzén, "Eternal Questions: Free Will and Divine Omniscience". Logician Franzén complains about fallacy lists and the fact that the modal scope fallacy is usually missing from such lists, and gives an example of the fallacy encountered in debates on the web. Franzén goes on to complain about what I call "fallacy abuse"—for instance, the tendencies to think that every bad argument is an instance of some named fallacy, or to hastily denounce debate opponents' arguments as fallacious before understanding them.

Some of these errors are the result of what Pope denounced as "a little learning", which can only be remedied by more learning, a lack that this entry may help to fill.

Poisoning the Well



Etymology:
The phrase "poisoning the well" ultimately alludes to the medieval European myth that the black plague was caused by Jews poisoning town wells—a myth which was used as an excuse to persecute Jews.
The phrase was first used in its relevant sense by Cardinal John Henry Newman during a controversy with Charles Kingsley:
…[W]hat I insist upon here…is this unmanly attempt of his, in his concluding pages, to cut the ground from under my feet;—to poison by anticipation the public mind against me, John Henry Newman, and to infuse into the imaginations of my readers, suspicion and mistrust of every thing that I may say in reply to him. This I call poisoning the wells.
"I am henceforth in doubt and fear," he says, "as much as any honest man can be, concerning every word Dr. Newman may write. How can I tell that I shall not be the dupe of some cunning equivocation?" …
Well, I can only say, that, if his taunt is to take effect, I am but wasting my time in saying a word in answer to his foul calumnies… We all know how our imagination runs away with us, how suddenly and at what a pace;—the saying, "Caesar's wife should not be suspected," is an instance of what I mean. The habitual prejudice, the humour of the moment, is the turning-point which leads us to read a defence in a good sense or a bad. We interpret it by our antecedent impressions. The very same sentiments, according as our jealousy is or is not awake, or our aversion stimulated, are tokens of truth or of dissimulation and pretence. There is a story of a sane person being by mistake shut up in the wards of a Lunatic Asylum, and that, when he pleaded his cause to some strangers visiting the establishment, the only remark he elicited in answer was, "How naturally he talks! you would think he was in his senses." Controversies should be decided by the reason; is it legitimate warfare to appeal to the misgivings of the public mind and to its dislikings? Any how, if Mr. Kingsley is able thus to practise upon my readers, the more I succeed, the less will be my success. … The more triumphant are my statements, the more certain will be my defeat.
Source: John Henry Newman, *Apologia Pro Vita Sua*

Type: Argumentum ad Hominem

Example:

I wish it were possible for men to get really emotionally involved in this question [abortion]. It is really impossible for the man, for whom it is impossible to be in this situation, to really see it from the woman's point of view. That is why I am concerned that there are not more women in this House available to speak about this from the woman's point of view.

Source: *House of Commons Debates of Canada*, Volume 2, November 30, 1979, p. 1920

Analysis

Exposition:

To poison the well is to commit a pre-emptive *ad hominem* strike against an argumentative opponent. As with regular *ad hominem*s, the well may be poisoned in either an abusive or circumstantial way. For instance:

1. "Only an ignoramus would disagree with fluoridating water." (Abusive)
2. "My opponent is a dentist, so of course he will oppose the fluoridating of water, since he will lose business." (Circumstantial)

Anyone bold enough to enter a debate which begins with a well-poisoning either steps into an insult, or an attack upon one's personal integrity. As with standard *ad hominem*s, the debate is likely to cease to be about its nominal topic and become a debate about the arguer. However, what sets Poisoning the Well apart from the standard Ad Hominem is the fact that the poisoning is done *before* the opponent has a chance to make a case.

Exposure:

Poisoning the Well is not, strictly speaking, a logical fallacy since it is not a type of argument. Rather, it is a logical boobytrap set by the poisoner to tempt the unwary audience into committing an *ad hominem* fallacy. As with all forms of the *ad hominem*, one should keep in mind that an argument can and must stand or fall on its own, regardless of who makes it.

Analysis of the Example:

This is a common type of circumstantial poisoning of the well, which claims that men should either not make a judgment about abortion, or should keep it to themselves if they do. This illustrates the effect that poisoning the well tends to have, which is to forestall opposition in debate. It also shows the mistake underlying all poisoning of the well, since the sex of the arguer is irrelevant to the merits of the argument. No doubt one could always find a woman to advance the argument, whatever it is.

Sources:

- S. Morris Engel, *With Good Reason: An Introduction to Informal Fallacies (Fifth Edition)* (St. Martin's, 1994), pp. 206-209.
- Douglas N. Walton, *Informal Fallacies: Towards a Theory of Argument Criticisms* (John Benjamins, 1987), pp. 217-222.

Acknowledgment:

The skull and crossbones magnet is available from AllPosters.

Post Hoc

Alias: Post Hoc, Ergo Propter Hoc

Translation: "After this, therefore because of this" (*Latin*)

Type: Non Causa Pro Causa

Forms

Event **C** happened immediately prior to event **E**.
Therefore, **C** caused **E**.

Events of type **C** happen immediately prior to events of type **E**.
Therefore, events of type **C** cause events of type **E**.

Examples

The only policy that effectively reduces public shootings is right-to-carry laws. Allowing citizens to carry concealed handguns reduces violent crime. In the 31 states that have passed right-to-carry laws since the mid-1980s, the number of multiple-victim public shootings and other violent crimes has dropped dramatically. Murders fell by 7.65%, rapes by 5.2%, aggravated assaults by 7%, and robberies by 3%.

Source: "The Media Campaign Against Gun Ownership", *The Phyllis Schlafly Report*, Vol. 33, No. 11, June 2000.

…[E]vidence shows that even state and local handgun control laws work. For example, in 1974 Massachusetts passed the Bartley-Fox Law, which requires a special license to carry a handgun outside the home or business. The law is supported by a mandatory prison sentence. Studies by Glenn Pierce and William Bowers of Northeastern University documented that after the law was passed handgun homicides in Massachusetts fell 50% and the number of armed robberies dropped 35%.

Source: "Fact Card", Handgun Control, Inc.

Analysis of the Examples

Counter-Example:

Roosters crow just before the sun rises.
Therefore, roosters crowing cause the sun to rise.

Exposition:

The Post Hoc Fallacy is committed whenever one reasons to a causal conclusion based solely on the supposed cause preceding its "effect". Of course, it is a necessary condition of causation that the cause precede the effect, but it is not a sufficient condition. Thus, post hoc evidence may suggest the hypothesis of a causal relationship, which then requires further testing, but it is never sufficient evidence on its own.

Exposure:

Post Hoc also manifests itself as a bias towards jumping to conclusions based upon coincidences. Superstition and magical thinking include Post Hoc thinking; for instance, when a sick person is treated by a witch doctor, or a faith healer, and becomes better afterward, superstitious people conclude that the spell or prayer was effective. Since most illnesses will go away on their own eventually, *any* treatment will seem effective by Post Hoc thinking. This is why it is so important to test proposed remedies carefully, rather than jumping to conclusions based upon anecdotal evidence.

Sibling Fallacy: Cum Hoc, Ergo Propter Hoc

Source:

T. Edward Damer, *Attacking Faulty Reasoning: A Practical Guide to Fallacy-Free Arguments (Third Edition)* (Wadsworth, 1995), pp. 131-132.

Resources:

- Julian Baggini, "Post Hoc Fallacies", *Bad Moves*.
- Robert Todd Carroll, "Post Hoc Fallacy", *Skeptic's Dictionary*.

Analysis of the Examples:

These two examples show how the same fallacy is often exploited by opposite sides in a debate, in this case, the gun control debate. There are clear claims of causal relationships in these arguments. In the anti-gun control example, it is claimed that so-called "right-to-carry" laws "effectively reduce" public shootings and violent crime. This claim is supported by statistics on falling crime rates since the mid-1980s in states that have passed such laws. In the pro-gun control example, it is claimed that state and local gun control laws "work", presumably meaning that the laws play a causal role in lowering handgun crime. Again, the claim is supported by statistics on falling crime rates in one state. However, the evidence in neither case is sufficient to support the causal conclusion.

For instance, violent crime in general fell in the United States in the period from the mid-1980s to the present, and—for all that we can tell from the anti-gun control argument—it may have fallen at the same or higher rates in states that did not pass "right-to-carry" laws. Since the argument does not supply us with figures for the states without such laws, we cannot do the comparison.

Similarly, the pro-gun control argument does not make it clear when Massachusett's drop in crime occurred, except that it was "after"—"post hoc"—the handgun control law was passed. Also, comparative evidence of crime rates over the same period in states that did not pass such a law is missing. The very fact that comparative information is *not* supplied in each argument is suspicious, since it suggests that it would have weakened the case.

Another point raised by these examples is the use of misleadingly precise numbers, specifically, "7.65%" and "5.2%" in the anti-gun control example. Especially in social science studies, percentage precision to the second decimal place is meaningless, since it is well within the margin of error on such measurements. It is a typical tactic of pseudo-scientific argumentation to use overly-precise numbers in an attempt to impress and intimidate the audience. A real scientist would not use such bogus numbers, which casts doubt upon the status of the source in the example. The pro-gun control argument, to its credit, does not commit this fallacy. This suggests, though it doesn't nail down, an appeal to misleading authority in the anti-gun control one.

Resources:

- Fake Precision
- Appeal to Misleading Authority

Acknowledgment: The Andy Warhol print of handguns is available from AllPosters.

Probabilistic Fallacy

Type: Formal Fallacy

Exposition:

A probabilistic argument is one which concludes that something has some probability based upon information about probabilities given in its premises. Such an argument is invalid when the inference from the premises to the conclusion violates the laws of probability. Probabilistic fallacies are formal ones because they involve reasoning which violates the formal rules of

probability theory. Thus, understanding probabilistic fallacies requires a knowledge of probability theory.

A Short Introduction to Probability Theory:

In the following laws of probability, the probability of a statement, **s**, is represented as: P(**s**).

1. P(**s**) ≥ 0.
   The probability of a statement is a real number greater than or equal to 0, where a probability of zero means that the statement is necessarily false.
2. P(**t**) = 1, if **t** is a tautology.
   The probability of any tautology is equal to 1.
3. P(**s** or **t**) = P(**s**) + P(**t**), if **s** and **t** are contraries.
   If two statements are contraries, then the probability of their disjunction is equal to the sum of their individual probabilities.
   A conditional probability is the probability of a statement on the condition that some statement is true. For instance, the probability of getting lung cancer is an unconditional probability, whereas the probability of getting lung cancer given that you smoke cigarettes is a conditional probability, as is the probability of getting lung cancer if you don't smoke. Each of these probilities is distinct: The probability of getting lung cancer if you smoke is higher than the unconditional probability of getting lung cancer, which is higher than the probability of getting lung cancer if you don't smoke. The conditional probability of **s** given **t** is represented as: P(**s** | **t**).
4. P(**s** | **t**) = P(**s** & **t**)/P(**t**).
   The conditional probability of **s** given **t** is equal to the probability of the conjunction of **s** and **t** divided by the probability of **t**, assuming that P(**t**) ≠ 0.

The above laws are logically sufficient to prove every fact within probability theory.

Exposure:

Mistakes in reasoning about probabilities are typically not treated as formal fallacies by logicians. This is presumably because logicians usually do not make a study of probability theory, and the mathematicians who do don't generally study logical fallacies. However, in recent decades, psychologists have discovered through observation and experiment that people are prone to make certain types of error when reasoning about probabilities. As a consequence, there is now much more empirical evidence for the existence of certain fallacies about probabilities than there is for most traditional fallacies. Again, logicians are often unaware of the existence of this evidence, and they usually do not discuss it in works on logical fallacies. It is about time that logicians broadened their intellectual horizons and began to take note of discoveries in the psychology of reasoning.

Resource: Amir D. Aczel, *Chance: A Guide to Gambling, Love, the Stock Market, & Just About Everything Else* (2004). About as untechnical an introduction to probability theory as you will find.

Fallacy of Propositional Logic

Type: Formal Fallacy

Exposition:

Propositional logic is a system which deals with the logical relations that hold between propositions taken as a whole, and those compound propositions which are constructed from simpler ones with truth-functional connectives. For instance, consider the following proposition:

Today is Sunday and it's raining.
This is a compound proposition containing the simpler propositions:

- Today is Sunday.
- It's raining.

Moreover, the connective "and" which joins them is truth-functional, that is, the truth-value of the compound proposition is a function of the truth-values of its components. The truth-value of a conjunction, that is, a compound proposition formed with "and", is true if both of its components are true, and false otherwise.
Propositional logic studies the logical relations which hold between propositions as a result of truth-functional combinations, for instance, the example conjunction implies "today is Sunday". There are a number of other truth-functional connectives in English in addition to conjunction, and the ones most frequently studied in propositional logic are:

- **Disjunction**: "or"
- **Negation**: "not"
- **Conditional**: "only if"
- **Biconditional**: "if and only if"

Since a validating argument form is one in which it is impossible for the premises to be true and the conclusion false, you can use the truth-functions to determine that forms in propositional logic are validating. For instance, the earlier example involving conjunction is an instance of the following argument form:

Simplification
p and **q**.
Therefore, **p**.

This form is validating because, no matter what propositions we put for **p** and **q**, if the premise is true, then both **p** and **q** will be true, which means that the conclusion will also be true. Thus, to show that a propositional argument form is *non*-validating, all that you have to do is find an argument of that form which has true premises and a false conclusion.

Subfallacies:

- Affirming a Disjunct
- Affirming the Consequent
- Commutation of Conditionals
- Denying a Conjunct
- Denying the Antecedent
- Improper Transposition

Source:

Robert Audi (General Editor), *The Cambridge Dictionary of Philosophy*, 1995.

Resources:

This discussion of propositional logic is by necessity brief, since I am only trying to give the minimal background required to understand the subfallacies above. For a lengthier explanation of propositional logic, see the following:

- Howard Pospesel, *Introduction to Logic: Propositional Logic (Third Edition)* (Prentice Hall, 1998). A good textbook on propositional logic for beginners.
- Peter Suber, Propositional Logic Terms and Symbols.

Fallacy of Quantificational Logic

Type: Formal Fallacy

Exposition:

Quantificational logic is an extension of propositional logic which examines the logical properties of some of the internal grammatical structure of simple, non-compound propositions. Consider the proposition:

Socrates is wise.

This is a simple proposition because it does not contain any propositional parts joined by truth-functional connectives. However, in quantificational logic, it has an internal structure consisting of a *name* and a *predicate*. "Socrates", of course, is a name. In addition to names, quantificational logic has individual variables which stand in for names. So, in the example, "**x** is wise" is the predicate, with the variable "**x**" acting as a placeholder for a name; replace the variable with the name "Socrates" and we get the example proposition. For this reason, quantificational logic is sometimes called "predicate logic".

The final new grammatical element in quantificational logic, which gives it that name, is the category of *quantifier*. There are many quantifiers, just as there are many truth-functional connectives, but the two most frequently encountered in quantificational logic, and which you need to know about to understand quantificational fallacies, are the following:

Universal Quantifier	Existential Quantifier
All **x**	Some **x**
Examples	
All philosophers are wise.	*Some* philosophers are silly.

These quantifiers can be combined in simple propositions in complex ways that go beyond what can be done with the categorical propositions used in categorical syllogisms. For example:

All dogs hate some cat.

As with propositional fallacies, to show that a quantificational argument form is non-validating, it suffices to find an instance of that form with true premises and a false conclusion, that is, a counter-example.

Source:

Robert Audi (General Editor), *The Cambridge Dictionary of Philosophy (Second Edition)*, 1995, pp. 272-3.

Subfallacies:

- Existential Fallacy
- Illicit Conversion
- Quantifier Shift
- Some Are/Some Are Not

Question-Begging Analogy

Type:

- Begging the Question
- Weak Analogy

Form:

x is similar to **y** (where the similarity depends for its strength upon some assumption which begs the question).

x is **P**.
Therefore, **y** is **P**.
Example:
Do animals deserve the same respect as black people? That's the question posed in an online exhibit by People for the Ethical Treatment of Animals. The exhibit pairs a slave auction with a cattle auction, two hanging black men with a hanging steer, herded Native Americans with herded cattle, a burning black man with a burning chicken, a shackled black ankle with a chained elephant hoof, and a pygmy in a zoo with a monkey in a dress.
Source: William Saletan, "KKK vs. KFC", *Slate*, 8/17/2005

Exposition:

An analogical argument begs the question when the strength of the analogy depends upon some controversial point at issue.

Exposure:

Some animal rights supporters draw a detailed analogy between the treatment of nonhuman animals in contemporary America and the Jewish Holocaust of World War II. Slaughterhouses are compared to Nazi extermination camps, both of which involve large-scale killing through an efficient, assembly-line process. The conclusion is that the treatment of animals is morally similar to the Holocaust perpetrated by the Nazis.
This argument begs an important question concerning the moral status of nonhuman animals. Of course, many advocates of animal rights and ethical vegetarianism consider all animals to be morally equal, so for them this is not a disanalogy. For the audience at whom such arguments are directed, however, there is a moral difference between human beings and other animals. In fact, much of the moral outrage at the Nazi atrocities comes from the treatment of Jews "like animals", as we say, violating their human dignity. Thus, without the underlying assumption of the moral equality of humans and other animals, the analogy between the Holocaust and so-called "factory farming" is superficial. If it is not wrong to kill animals for food, then it is not wrong to do so efficiently and in large numbers.
This is not to deny that there is inhumane treatment of animals; rather, that there is a moral equivalence between such inhumanity and the inhuman treatment of *persons* in Auschwitz. Furthermore, if all animals are indeed morally equal, then killing animals for food is equivalent to murder. However, this claim must be shown by a separate argument, and cannot be established by the tendentious analogy with the Holocaust, which depends logically upon it.

Resource:

David Hackett Fischer, *Historians' Fallacies: Toward a Logic of Historical Thought*, (Harper & Row, 1970), Chapter IX: "Fallacies of False Analogy". Fischer does not discuss this particular fallacy, but has the most detailed discussion of analogical arguments and their fallacies of which I am aware.

Redefinition

Alias: Arbitrary Redefinition
Type: Equivocation

Example:

In July 1993, the Commonwealth Fund released the results of a telephone survey of 2,500 women, designed and carried out by Louis Harris and Associates. The

Commonwealth and Harris investigators took their questions directly from the Gelles and Straus survey.... [T]he Harris/Commonwealth survey concluded that as many as four million women a year were victims of physical assaults.... But the most interesting finding of all, and one entirely overlooked by the press, for it did not harmonize with the notes of alarm in the Harris/Commonwealth press releases, was the response the poll received...about the most severe forms of violence. Gelles and Straus had estimated that these things happen to fewer than 1 percent of women. According to the survey sample, the percentage of women who had these experiences was virtually *zero*; all respondents answered 'no' to all the questions on severe violence. This finding does not, of course, mean that no one was brutally attacked. But it does suggest that severe violence is relatively rare.

So where did the four million figure for physical assault come from? … Clearly the interpreters of the Harris/Commonwealth poll data were operating with a much wider conception of 'abuse' than Gelles and Straus. Looking at the "survey instrument", we find that they had indeed opened the door wide to the alarmist conclusions they disseminated. … To arrive at the figure of four million for *physical* abuse, the survey used the simple expedient of ignoring the distinction between minor and severe violent acts, counting all acts of violence as acts of abuse. Five percent of women they spoke to said they had been "pushed, grabbed, shoved, or slapped"; they were all classified as victims of domestic violence and added in to get a projection of four million victims nationwide. … If a couple has a fight, and she stomps out of the room (or yard), and he grabs her arm, this would count as a violent physical assault on her.

…As for jounalists and the newscasters, their interests too often lie in giving a sensational rather than an accurate picture of gender violence, and they tend to credit the advocacy sources. Better four million or five than one or two. … And all the better, too, if the media's readers and viewers get the impression that the inflated figures refer not to slaps, shoves, or pushes but to brutal, terrifying, life-threatening assaults.

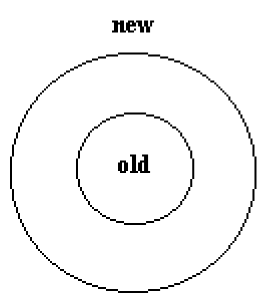
Analysis

Source: Christina Hoff Sommers, *Who Stole Feminism?* (1994), pp. 196-198.

Exposition:

To redefine a term is, of course, to assign it a new meaning. It is not necessarily fallacious to give a term a new meaning, and it is often done to produce technical terms, but it is a logical boobytrap. There is always a danger of slipping back into using the term in its old meaning out of habit, which could cause a fallacy of equivocation. We may start out reasoning with the term using its new meaning in the premises, then fall back into using it in its familiar meaning in the conclusion.

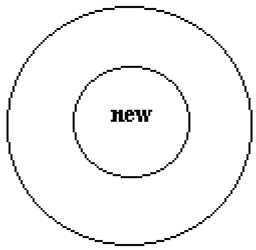
There are two types of redefinition, depending on whether the redefined meaning has a wider or



narrower extension than the original meaning:

- **Low Redefinition:** A redefinition is called "low" when the redefined term has a wider extension than originally. For instance, if the word "bat" were

redefined as "flying animal", then not only would bats be "bats", but so would many birds as well. So, the defining characteristic of a low redefinition is that the redefined term applies to some cases that the term in its original meaning does not.



- **High Redefinition:** A "high" redefinition is the opposite of a low one, that is, a redefinition is called "high" when the redefined term has a narrower extension than originally. For instance, if the word "bird" were redefined as "feathered flying animal", then flightless birds such as ostriches and penguins would no longer be "birds". So, the defining characteristic of a high redefinition is that the original term applies to some cases that the term in its redefined meaning does not.

High and low redefinition are not mutually exclusive categories, as it is possible for a redefinition to be both high and low. This happens when the redefinition applies to some things that the original definition did not, and fails to apply to other things that the original did. For example, if we redefine "bird" as "flying animal", then bats would be "birds" (low), while flightless birds would not (high).

It is even possible for the extension of a redefined term to be disjoint from the extension of the original meaning. This often happens when an existing word is redefined as a technical term. Fortunately, such technical terms are not likely to result in equivocation because the term's two meanings are too different to be confused. Confusion is most likely to occur when the slippage between meanings is subtle.

Exposure:

Statistical studies of vague concepts require redefinition so that the extension of the concept can be counted, which opens up the way for confusion and deception. Political groups and charities often have an interest in exaggerating the prevalence of some problem so that money can be raised, and political support mobilized, to address it. For this reason, polls and other studies of social problems commissioned by interest groups frequently use low redefinition in order to pump up the numbers. Moreover, the media often play along with interest groups because alarmingly high numbers make for attention-getting stories. So, the next time you hear about such a study, find out whether it was produced by a group with an interest in exaggerating the numbers, and ask yourself whether the numbers reported are plausible. If the numbers are implausibly high, check the report for a low redefinition.

Sources:

- Julian Baggini:
  - "High Redefinition", *Bad Moves*
  - "Low Redefinition", *Bad Moves*
- Antony Flew, *How to Think Straight* (1998), Section 3.7

Analysis of the Example:

The Harris/Commonwealth poll was based on a low redefinition of "physical abuse" which produced a large number of cases. "Physical abuse" is a vague concept, and any statistical study of it will have to define it in some precise way in order to be able to count it. Arm-grabbing and pushing may count as "physical abuse" in some situations, so that it makes sense to include questions about them in the poll. However, such a broad definition is a logical boobytrap which could lead to the conclusion that there are more cases of severe violent assaults on women than indicated by the poll.

The Regression Fallacy

Alias: The Regressive Fallacy
Type: Non Causa Pro Causa

Example:

KUALA LUMPUR: Prime Minister Datuk Seri Dr Mahathir Mohamad congratulated Malaysian shuttler Mohd Hafiz Hashim for his achievement but warned that he should not be "spoilt" with gifts like previous champions.

"Very good and congratulations, but now I would like to request everybody not to spoil him," he said when asked to comment on Hafiz's victory in the men's singles final of the All-England Badminton Championships on Sunday.

Dr Mahathir said people should remember what had happened to previous champions when they were spoilt with gifts of land, money and other items.

"I hope the states will not start giving acres of land and money in the millions, because they all seem not to be able to play badminton after that," he said after taking part in the last dry run and dress rehearsal for the 13th NAM Summit at the PWTC yesterday.

Source:"Mahathir asks states not to 'spoil' Hafiz", *The Star Online*, 2/18/2003

Exposition:

The Regression Fallacy is the result of a statistical phenomenon known as "regression to the mean". The "mean" refers to the arithmetical average of some variable in a population, that is, the "mean" is what we usually mean by "average". "Regression" refers to the value of the variable tending to move closer to the mean, away from extreme values. So, "regression to the mean" refers to the tendency of a variable characteristic in a population to move away from the extreme values towards the average value.

Consider a sample taken from a population. The value of the variable will be some distance from the mean. For instance, we could take a sample of people—it could be just one—measure their heights, and then determine the average height of the sample. This value will be some distance away from the average height of the entire population of people, though the distance might be zero.

Suppose, further, that we take a second sample of the population. If the value for the first sample is an extreme one—that is, far away from the mean—then it is likely that the value of the variable for the second sample will be closer to average than the first one. The farther away from the mean the first sample was, the more likely that the second will be closer to it. This is regression to the mean.

For example, the children of tall parents tend to be tall themselves, but not as tall as their parents. The fact that the children tend to be taller than average is probably the result of genetics, but the fact that they tend not to be as tall as their parents is the result of regression to the mean. The

Regression Fallacy occurs when one mistakes regression to the mean, which is a statistical phenomenon, for a causal relationship. For example, if a tall father were to conclude that his tall wife committed adultery because their children were shorter, he would be committing the regression fallacy. 

Exposure:

One of the most common occasions for the Regression Fallacy is illness. People are most likely to seek treatment for an illness—especially experimental treatment—when they are at their sickest, that is, their condition is an extreme one. They take a remedy, and then get better due to regression to the mean, but they attribute their regained health to the effect of the remedy. This is one reason why some people will swear by such bizarre treatments as drinking urine, or psychic surgery.

"It worked for me", they say, when all they really know is that they took the remedy and they got better. Due to regression to the mean, many people will get better no matter what treatment they take, even none at all. Some will die, luckily for the snake oil salesmen, since the dead won't be around to badmouth the snake oil that they took before dying.

Regression to the mean is one reason why it is difficult to determine whether a potential remedy is really effective; one cannot tell simply by taking it when ill.

Sources:

- Tim van Gelder, Critical Reflections, 2/18/2003
- Thomas Gilovich, *How We Know What Isn't So: The Fallibility of Human Reason in Everyday Life* (Free Press, 1991), pp. 23-28.

Reader Response:

Dana Brown makes the following objection to the Example:

I noticed something I disagree with: in the regression fallacy page, you give, as an example, a tennis player who wins tournaments and then doesn't win. However, the "regression to the mean" occurs because one assumes that luck was involved in the first observation being so far away from the mean. This is, strictly speaking, true in all circumstances—but the proportion of luck to skill involved in winning a tennis championship, I suspect, is greatly tipped towards skill. Thus, I think it improper to suggest that what "caused" the tennis players to not win again was solely regression to the mean, when the Malaysian prime minister may, in fact, have been right in believing that the winners got spoiled—logically, nothing favors one explanation over the other.

Regression to the mean will affect any variable that is at least partly random. So, even though skill is the primary factor in winning tennis, as long as there is some degree of luck involved, regression to the mean will occur. The prime minister might be right about what is causing the champions' playing to deteriorate, but he gives no evidence that the regression is due to the players being spoiled, other than the fact that they regressed. That's what makes this an example of the fallacy: the fact that the prime minister concludes that the players are spoiled on no other evidence than the fact that their play got worse, which is to be expected due to regression to the mean. This is not a claim about what "caused" the tennis players subsequent losses, since regression to the mean is a statistical, not a causal, phenomenon.

Scope Fallacy

Type: Amphiboly

Quote…

[A]n adjective placed before two juxtaposed nouns is apparently the servant of either master. So 'Fabulous Christmas Bargains' is taken to mean fabulous…bargains for Christmas, whereas 'Continental Holiday Brochures' are brochures for continental holidays. It is no answer to say that commonsense will guide us to the right interpretation; bargains for a wonderful Christmas and continental leaflets for holidays are both real concepts. And what of the shop's apology based on 'Temporary Assistant Shortage'?—is this a shortage of temporary assistants…or a temporary shortage of assistants (whether *they* are permanent or not)? It will be realised that this seemingly pithy form of expression is always technically open to two meanings, is sometimes actually so, and is occasionally bizarre….

…Unquote

Source: Basil Cottle, *The Plight of English: Ambiguities, Cacophonies and Other Violations of Our Language* (Arlington House, 1975), pp. 33-34.

Example:

All that glitters is not gold.
This rock glitters.
Therefore, this rock is not gold.

Exposition:

"Scope" is a technical notion, but if you're not familiar with it you can acquire a grasp of it through examples. For instance, consider the famous saying:
All that glitters is not gold.
This proposition is ambiguous because the scope of the negation—"not"—is ambiguous. There are two possible scopes, and thus two possible interpretations of the saying:

1. **Narrow scope:** The "not" negates the predicate "is gold", so that the saying is equivalent to:
   All that glitters is *non*-gold.
   This is the most literal interpretation of the proposition, since the negation actually occurs in the middle of the predicate: "is *not* gold". However, since gold does glitter, this interpretation makes the saying into a false proposition.
2. **Broad scope:** The "not" negates the entire rest of the sentence, that is: "all that glitters is gold". In other words, the proposition is equivalent to:
   Not all that glitters is gold.

This, of course, is the correct interpretation, meaning that *some* things which glitter are non-gold, for instance, fool's gold. Or, in another cliché, don't judge a book by its cover.

Logical terms such as "not" have a scope, that is, a part of the proposition in which they occur that they affect logically. For example, "not" logically negates some part of the proposition, or the proposition taken as a whole, and this is its scope.

In the artificial languages of logic, scope ambiguity is avoided by conventions for interpreting propositions, and by introducing additional punctuation (usually parentheses) to indicate scope. Contrastingly, in natural languages, while there are various grammatical devices to indicate scope, ambiguity is still frequent. Often, natural language is disambiguated by common sense knowledge that we bring to our interpretations. For instance, in the example, we automatically reject the first interpretation because that would make the proposition false. Thus, scope ambiguity in natural language is often not obvious until pointed out, or exploited for humor.

Usually, scope ambiguity takes the form of a "broad" and "narrow" scope, as in the example, where the broad scope often is the entire sentence, and the narrow scope is some smaller part of it. Since this is a type of structural ambiguity, and not equivocation on the meaning of words, scope ambiguity is a type of amphiboly.

The following types of logical and grammatical categories have scope, and are therefore liable to ambiguities of scope in natural languages:

- **Propositional connectives:** "not", "and", "or", etc.
- **Quantifiers:** "every", "some", etc. See Quantifier-Shift Fallacy
- **Modalities:** "possibly", "believes", "ought", etc. See Modal Scope Fallacy
  Example: "If Sam Clemens was Mark Twain, then he *must* have written *Huck Finn*."
  This sentence has two possible meanings depending upon the scope of "must":
  1. **Narrow scope:** The scope of "must" is the consequent of the conditional: Given that Sam Clemens and Mark Twain were the same person, then this person *had to* write *Huck Finn*, that is, he could not do otherwise. This interpretation, of course, is false.
  2. **Wide scope:** The scope of "must" is the conditional proposition as a whole: It necessarily follows from the fact that Sam Clemens was identical with Mark Twain, that he wrote *Huck Finn*. This is the correct interpretation; since we know that Mark Twain wrote *Huck Finn*, it follows with necessity from the fact that Sam Clemens *was* Mark Twain that Clemens wrote *Huck Finn*.
- **Adverbial and adjectival modifiers:**
  Example: "little girls' school"
  This phrase has two possible meanings depending upon the scope of "little":
  1. **Narrow scope:** A school for small girls. "Little" modifies "girls'".
  2. **Wide scope:** A girls' school which is small. "Little" modifies "girls' school".

Scope ambiguities, as ambiguities in general, are linguistic boobytraps which can cause people to fall into fallacy. Of all amphibolies, scope ambiguities seem to be those most likely to cause fallacious reasoning, especially in philosophical and pseudo-philosophical arguments.

Subfallacies:

- Modal Scope Fallacy
- Quantifier-Shift Fallacy

Source:

Ted Honderich (editor),*The Oxford Companion to Philosophy*, 1995.

Resource:

Headlines: Scope Fallacy
Humorous Headlines Torn from Today's Newspapers

Some Are/Some Are Not

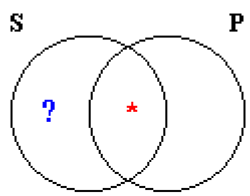
Alias: Unwarranted Contrast
Type: Fallacy of Quantificational Logic

Forms

Some **S** are **P**. Therefore, some **S** are not **P**.	Some **S** are not **P**. Therefore, some **S** are **P**.

Venn Diagram:

This diagram is for the first form above. A diagram for the second form is obtained by taking circle **P** to represent non-**P**. The diagram shows this form of argument to be non-validating, because the area with a question mark may be empty, so far as the premise indicates.



Example:

Some politicians are crooks.
Therefore, some politicians are not crooks.

Exposition:

To understand the nature of this fallacy, one needs to know the difference between logical *implication* and conversational *implicature*:

1. **Implication:** This is a relation between propositions, that is, the meanings of statements.
2. **Implicature:** This is a relation between the fact that someone makes a statement and a proposition.

For example, suppose that I state that today is Sunday and it's raining. This statement logically *implies* that it's raining. In contrast, the fact that I made the statement *implicates* that I believe that it's raining. The statement taken by itself implies nothing about what I believe; rather, it is the *fact* that I made the statement which implicates that I believe it.

Why does the fact that I made the statement implicate that I believe it? All conversational implicature is based on certain rules (or "maxims", as the philosopher Paul Grice called them) which govern cooperative communication. One of these rules is that you should state only what you believe (which Grice called a maxim of "Quality"). Thus, from the fact that I state something, you can conclude that I believe it. Of course, I might be lying, but conversational implicature is based upon the presumption that people are trying to cooperate, and thus are obeying the rules.

How does this relate to the Fallacy of Some Are/Some Are Not? There is another rule of conversation (called by Grice a maxim of "Quantity") that one should make statements as logically strong as is consistent with telling the truth (Quality). So, while a statement of the form "Some **S** are **P**" does not logically imply "Some **S** are not **P**", the fact that someone makes the

former statement conversationally implicates the latter. In other words, if one knows that *all* **S** are **P** one should say so, and the fact that one says only that *some* are implicates that one does not believe that *all* are. This latter fact, together with the assumption that you know what you're talking about (Quality, again), implicates that not all **S** are **P**.

Thus, the theory of conversational implicature explains how it is possible to mislead—if not actually lie—while still speaking the literal truth; by means of what we call "half-truths", we can implicate falsehoods with our statements. If we know that all **S** are **P**, then the statement that *some* are is a half-truth. Half-truths are wholly true, since truth and falsity do not come in degrees, but they are misleading because they violate norms of efficient communication. Hence, the legal oath to tell the truth (Quality), the *whole truth* (Quantity), and nothing but the truth (Quality, again).

So, what is the Fallacy of Some Are/Some Are Not? It is the mistake of confusing logical implication and conversational implicature by thinking that "some are" statements logically imply "some are not" statements, when the former statements only conversationally implicate the latter.

Sources:

- Robert Audi (General Editor), *The Cambridge Dictionary of Philosophy (Second Edition)*, 1995, p. 273.
- Paul Grice, "Logic and Conversation", reprinted in *Studies in the Way of Words* (Harvard, 1989).

Special Pleading

Type: Informal Fallacy

Form:

Rule: **X**s are generally **Y**s.
x is an **X**.
x is an exception to the rule because it is **I** (where **I** is an irrelevant characteristic).
Therefore, **x** is not a **Y**.

Example:

The law requires everyone to follow the speed limit and other traffic regulations, but in Suffolk County, exceptions should be made for cops and their families, police union officials say.

Police Benevolent Association president Jeff Frayler said Thursday it has been union policy to discourage Suffolk police officers from issuing tickets to fellow officers, regardless of where they work.

"Police officers have discretion whenever they stop anyone, but they should particularly extend that courtesy in the case of other police officers and their families," Frayler said in a brief telephone interview Thursday. "It is a professional courtesy."

Source: J. Jioni Palmer, "PBA: Don't ticket cops", *Newsday*, 2004. (This links to Google's cache of the article which appears to be no longer available from *Newsday*'s site.)

Analysis

Counter-Example:

Police officers occasionally have to shoot and kill suspects. So, family members of police officers should never be charged with murder if they shoot and kill someone. It's a professional courtesy.

Exposition:

Many rules—called "rules of thumb"—have exceptions for relevant cases. The fallacy of Special Pleading occurs when someone argues that a case is an exception to a rule based upon an irrelevant characteristic that does not define an exception.

Exposure:

People are most tempted to engage in special pleading when they are subject to a law or moral rule that they wish to evade. People often attempt to apply a "double standard", which makes an exception to the rule for themselves—or people like them—but applies it to others. They usually do not argue that they, or their group, should be exempt from the rule simply because of who they are; this would be such obvious special pleading that no one would be fooled. Instead, they invoke some characteristic that they have that sets them apart; however, if the characteristic is not a relevant exception to the rule, then they are engaged in special pleading.

Analysis of the Example:

The rule in this example is the speed limit, which has exceptions. For instance, it is legally permissible for on-duty police officers, driving their official vehicles, to break the speed limit in pursuit of criminals or to answer emergency calls. However, off-duty officers driving private cars have no more reason to break the speed limit than do other citizens. The mere fact of being a police officer is an irrelevant characteristic rather than an exception to the law. *A fortiori*, it is an irrelevant characteristic to be a family member of a police officer. So, it is a case of special pleading to argue that off-duty police officers and their families should not be ticketed in circumstances in which a civilian would be.

Source:

T. Edward Damer, *Attacking Faulty Reasoning: A Practical Guide to Fallacy-Free Arguments (Third Edition)* (Wadsworth, 1995), pp. 122-124.

The Straw Man Fallacy

Type: Red Herring

Etymology:

"Straw man" is one of the best-named fallacies, because it is memorable and vividly illustrates the nature of the fallacy. Imagine a fight in which one of the combatants sets up a man of straw, attacks it, then proclaims victory. All the while, the real opponent stands by untouched.

Quote…

When your opponent sets up a straw man, set it on fire and kick the cinders around the stage. Don't worry about losing the Strawperson-American community vote.

…Unquote

Source: James Lileks, "The Daily Bleat"

Example:

Some of you may have seen the 90-minute ABC network television show…entitled "Growing Up in the Age of AIDS".… I was one of nine guests on that live program.… …[A] single 45-second sound bite cost me a long journey and two hectic days in New York City.

Why…did I travel to The Big Apple for such an insignificant role? …I felt a responsibility to express the abstinence position on national television.… How sad that adolescents hear only the dangerous "safe sex" message from adults who should know better.

What follows, then, is what I would have said on television.…

Why, apart from moral considerations, do you think teenagers should be taught to abstain from sex until marriage?
…[N]ot one of 800 sexologists at a recent conference raised a hand when asked if they would trust a thin rubber sheath to protect them during intercourse with a known HIV infected person. … And yet they're perfectly willing to tell our kids that "safe sex" is within reach and that they can sleep around with impunity.
Source: James C. Dobson, in a fund-raising letter for "Focus on the Family", February 13, 1992.

Exposition:

Judging from my experience, Straw Man is one of the commonest of fallacies. It is endemic in public debates on politics, ethics, and religion.

The Straw Man is a type of Red Herring because the arguer is attempting to refute his opponent's position, and in the context is required to do so, but instead attacks a position—the "straw man"—not held by his opponent. In a Straw Man argument, the arguer argues to a conclusion that denies the "straw man" he has set up, but misses the target. There may be nothing wrong with the argument presented by the arguer when it is taken out of context, that is, it may be a perfectly good argument against the straw man. It is only because the burden of proof is on the arguer to argue against the opponent's position that a Straw Man fallacy is committed. So, the fallacy is not simply the argument, but the entire situation of the argument occurring in such a context.

Subfallacy:

As the "straw man" metaphor suggests, the counterfeit position attacked in a Straw Man argument is typically weaker than the opponent's actual position, just as a straw man is easier to defeat than a flesh-and-blood one. Of course, this is no accident, but is part of what makes the fallacy tempting to commit, especially to a desperate debater who is losing an argument. Thus, it is no surprise that arguers seldom misstate their opponent's position so as to make it *stronger*. Of course, if there is an obvious way to make a debating opponent's position stronger, then one is up against an incompetent debater. Debaters usually try to take the strongest position they can, so that *any* change is likely to be for the worse. However, attacking a logically stronger position than that taken by the opponent is a sign of strength, whereas attacking a straw man is a sign of weakness.

A common straw man is an extreme man. Extreme positions are more difficult to defend because they make fewer allowances for exceptions, or counter-examples. Consider the statement forms:

- All **P** are **Q**.
- Most **P** are **Q**.
- Many **P** are **Q**.
- Some **P** are **Q**.
- Some **P** are not **Q**.
- Many **P** are not **Q**.
- Most **P** are not **Q**.
- No **P** are **Q**.

The extremes are "All **P** are **Q**" and "No **P** are **Q**". These are easiest to refute, since all it takes is a single counter-example to refute a universal proposition. Moreover, the world being such as it is, unless **P** and **Q** are connected definitionally, such propositions are usually false. The other propositions are progressively harder to refute until you get to the middle two: "Some **P** are **Q**" and "Some **P** are not **Q**". To refute these requires one to prove the extremes: "No **P** are **Q**" or "All **P** are **Q**", respectively. So, extremists are those who take positions starting with "all" or

"no". For instance, the extremists in the abortion debate are those who argue that *no* abortions are permissible, or that *all* abortions are.

Therefore, Straw Man arguments often attack a political party or movement at its extremes, where it is weakest. For example, it is a straw man to portray the anti-abortion position as the claim that all abortions, with no exceptions, are wrong. It is also a straw man to attack abortion rights as the position that no abortions should ever be restricted, bar none. Such straw men are often part of the process of "demonization", and we might well call the subfallacy of the straw man which attacks an extreme position instead of the more moderate position held by the opponent, the "Straw Demon".

Source:

T. Edward Damer, *Attacking Faulty Reasoning: A Practical Guide to Fallacy-Free Arguments (Third Edition)* (Wadsworth, 1995), pp. 157-159.

Resources:

- Julian Baggini, "The Straw Man Fallacy", *Bad Moves*, 1/6/2004
- Michael C. Labossiere, "Straw Man"

Syllogistic Fallacy

Type: Formal Fallacy

Form:

Any non-validating form of categorical syllogism.

Exposition:

The categorical syllogism is part of the oldest system of formal logic, invented by the first formal logician, Aristotle. There are several techniques devised to test syllogistic forms for validation, including sets of rules, diagrams, and even mnemonic poems.

More importantly for us, there are sets of fallacies based upon the rules such that any syllogism which does not commit any of the fallacies will have a validating form. The subfallacies of Syllogistic Fallacy are fallacies of this rule-breaking type. If a categorical syllogism commits none of the subfallacies below, then it has a validating form. To understand these subfallacies, it is necessary to understand some basic terminology about categorical syllogisms:

A Short Introduction to Categorical Syllogisms:

A *categorical syllogism* is a type of argument with two premises—that is, a *syllogism*—and one conclusion. Each of these three propositions is one of four forms of categorical proposition:

Type	Form	Example
A	All **S** are *P*.	All whales are mammals.
E	No **S** are **P**.	No whales are fish.
I	Some *S* are *P*.	Some logicians are philosophers.
O	Some *S* are not **P**.	Some philosophers are not logicians.

These four types of proposition are called **A**, **E**, **I**, and **O** type propositions, as indicated. The variables, **S** and **P**, are place-holders for terms which pick out a class—or *category*—of thing; hence the name "categorical" proposition.

In a categorical syllogism there are three terms, two in each premise, and two occurrences of each term in the entire argument, for a total of six occurrences. The **S** and **P** which occur in its

conclusion—the **S**ubject and **P**redicate terms—are also called the "minor" and "major" terms, respectively. The major term occurs once in one of the premises, which is therefore called the "major" premise. The minor term also occurs once in the other premise, which is for this reason called the "minor" premise. The third term occurs once in each premise, but not in the conclusion, and is called the "middle" term.

The notion of distribution plays a role in some of the syllogistic fallacies: the terms in a categorical proposition are said to be "distributed" or "undistributed" in that proposition, depending upon what type of proposition it is, and whether the term is the subject or predicate term. Specifically, the subject term is distributed in the **A** and **E** type propositions, and the predicate term is distributed in the **E** and **O** type propositions. The other terms are undistributed. In the table above, the distributed terms are in **bold**, and the undistributed ones are in *italic*. Finally, the **A** and **I** type propositions are called "affirmative" propositions, while the **E** and **O** type are "negative", for reasons which should be obvious. Now, you should be equiped to understand the following types of syllogistic fallacy.

Subfallacies:

- Affirmative Conclusion from a Negative Premise
- Exclusive Premises
- Four-Term Fallacy
- Illicit Process
- Negative Conclusion from Affirmative Premises
- Undistributed Middle

Source:

Irving Copi & Carl Cohen, *Introduction to Logic (Tenth Edition)* (Prentice Hall, 1998), Chapter 8.

Acknowledgment: The print of the bust of Aristotle is available from AllPosters.

Texas Sharpshooter Fallacy

Type: Non Causa Pro Causa



Etymology:

The Texas sharpshooter is a fabled marksman who fires his gun randomly at the side of a barn, then paints a bullseye around the spot where the most bullet holes cluster. The story of this Texas shooter seems to have given its name to a fallacy first described in the field of epidemiology, which studies the way in which cases of disease cluster in a population.

Example:

The number of cases of disease **D** in city **C** is greater than would be expected by chance. City **C** has a factory which has released amounts of chemical agent **A** into the environment. Therefore, agent **A** causes disease **D**.

Exposition:

This fallacy occurs when someone jumps to the conclusion that a cluster in some data must be the result of a cause, usually one that it is clustered around. There are two reasons why this is fallacious:

1. The cluster may well be the result of chance, in which case it was not caused by anything.
2. Even if the cluster is not the result of chance, there are other possible reasons for the clustering, other than the cause chosen. For instance, in the **Example**, if disease **D** is contagious, it may be clustering around some person who carried it into the city.

At best, the occurrence of a cluster in the data is the basis not for a causal conclusion, but for the formation of a causal hypothesis which needs to be tested. Patterns in data can be useful for forming hypotheses, but they are not themselves sufficient evidence of a causal connection. In short, correlation is not causation.

Exposure:

This fallacy lives up to its striking name because the Texas sharpshooter takes a random cluster, and by drawing a target onto it makes it appear to be causally determined, as if the Texan were shooting at the target. Similarly, when looking at data, there is a danger of jumping to a conclusion that a random cluster is a causal pattern. Without further testing, such a conclusion is seldom if ever justified.

Sources:

- Carroll, Robert Todd, "Texas-Sharpshooter Fallacy", *The Skeptic's Dictionary*
- Gawande, Atul, "The Cancer-Cluster Myth", *The New Yorker*, February 8th, 1999, pp. 34-37.

Acknowledgment: The target poster is available from AllPosters.

Tu Quoque

Translation: "You, also" or "You're another", *Latin*

Type:

- Argumentum ad Hominem
- Two Wrongs Make a Right

Example:

Q: Now, the United States government says that you are still funding military training camps here in Afghanistan for militant, Islamic fighters and that you're a sponsor of international terrorism.… Are these accusations true? …

Osama Bin Laden: …At the time that they condemn any Muslim who calls for his right, they receive the highest top official of the Irish Republican Army at the White House as a political leader, while woe, all woe is the Muslims if they cry out for their rights. Wherever we look, we find the US as the leader of terrorism and crime in the world. The US does not consider it a terrorist act to throw atomic bombs at nations thousands of miles away, when it would not be possible for those bombs to hit military troops only. These bombs were rather thrown at entire nations, including women, children and elderly people and up to this day the traces of those bombs remain in Japan. The US does not consider it terrorism when hundreds of thousands of our sons and brothers in Iraq died for lack of food or medicine. So, there is no base for what the US says and this saying does not affect us.…

Source: "CNN March 1997 Interview with Osama bin Laden" (PDF)

Analysis

Exposition:

Tu Quoque is a very common fallacy in which one attempts to defend oneself or another from criticism by turning the critique back against the accuser. This is a classic Red Herring since

whether the accuser is guilty of the same, or a similar, wrong is irrelevant to the truth of the original charge. However, as a diversionary tactic, Tu Quoque can be very effective, since the accuser is put on the defensive, and frequently feels compelled to defend against the accusation.

Source:

S. Morris Engel, *With Good Reason: An Introduction to Informal Fallacies (Fifth Edition)* (St. Martin's, 1994), pp. 204-206.

Resource:

Julian Baggini, "Tu Quoque", *Bad Moves*, 10/1/2004

Analysis of the Example:

A perfect example of the fallacy of Tu Quoque. Notice that Bin Laden never addresses the question of whether he sponsors terrorism, instead simply turning the accusation back against the accuser. This is an irrelevancy designed to distract the audience from the question at issue, that is, it is a Red Herring. Even if all of Bin Laden's accusations are true, they have nothing to do with the question, and thus are irrelevant.

Reader Responses:

Lindsay Brown sent the following comments:

I have a problem with the example [of *tu quoque*] you provide, and would like you to reconsider it. I realize it is a debatable issue, but it is also a sensitive one. Hopefully that consideration will weigh in, illogical though it may be. So here is my quick case:

Bin Laden's response is not a good example of the *tu quoque* fallacy because he is speaking directly to the issue by first pointing out the *petitio principii* problem with the question that was posed to him. He is exposing the error of implicitly equating certain forms of "military training camps" and "fighters" with "terrorism", and not others. One convenient and *not* fallacious way for him to do so is by pointing out the similarities between the activity of the criticizer (U.S.) and the activity about which he is being questioned. To label one "terrorism" and not the other is, he is arguing, itself a fallacy. As such, the range of possible answers has already been begged by the way the question was asked. Bin Laden is saying: the question is fallacious as posed, and not answerable (it is a complex question). *Tu quoque* is only a fallacy when one uses it so as to divert attention from the issue at hand, or to avoid or fail to respond to an argument that non-fallaciously gave one the burden of proof. Neither of those is the case in your example.

Lindsay, the question asked by Arnett is not a complex question, rather it is a conjunctive question, that is, two questions in one. The question is: "Are these accusations true?", which refers back to the following two accusations in the preceding statement:

1. "You are still funding military training camps here in Afghanistan for militant, Islamic fighters."
2. "You're a sponsor of international terrorism."

A conjunctive question is not necessarily a loaded (complex) one, and Arnett's question is not loaded in the way you suggest. A loaded question is one which traps you into conceding something no matter how you answer it, such as: "Have you stopped beating your husband?" For this reason, it is reasonable to reject such a question if one rejects the statement it is loaded with ("you have beaten your husband").

I see no basis for your claim that the question equates training camps with terrorism, even implicitly; these are two separate accusations, as Arnett's "these" indicates. As a matter of fact the training camps in question were undoubtedly camps training terrorists, but Arnett does not even say so.

Bin Laden could answer both questions without conceding anything. He could have denied both accusations, accepted one and denied the other, or accepted both. Instead, using the "politician's answer", he avoids answering the question and turns the criticism back against his accuser. This is a clear-cut *tu quoque*.

Source:

Nigel Warburton, *Thinking from A to Z (Second Edition)*, "Politician's Answer", pp. 103-104.

Portia Jeffries asks the following question:

Isn't "Are you still funding military training camps here in Afghanistan for militant, Islamic fighters?" the same as "Are you still beating your wife?", which has been rephrased in the negative in your example. If so, isn't it a complex question?

The question does presume that bin Laden had funded such camps in the past, but not every question with a presupposition is a loaded one. A loaded question is one with a false, controversial, or question-begging presupposition. As far as I know, that bin Laden had funded these camps is none of these; though if so, he missed a chance to set the record straight instead of dodging the question. Nonetheless, if the presupposition is either false, controversial, or question-begging, then the question *is* a loaded one. To quote Lewis Carroll: "[I]f it were so, it would be; but as it isn't, it ain't. That's logic."

Source:

Lewis Carroll, *Through the Looking Glass*, Chapter 4.

Two Wrongs Make a Right

Type: Red Herring

Quote…

Consider that two wrongs never make a right,
But that three [lefts] do.

…Unquote

Source: "Deteriorata", *National Lampoon Radio Dinner Album*

Example:

The operation cost just under $500, and no one was killed, or even hurt. In that same time the Pentagon spent tens of millions of dollars and dropped tens of thousands of pounds of explosives on Viet Nam, killing or wounding thousands of human beings, causing hundreds of millions of dollars of damage. Because nothing justified their actions in our calculus, nothing could contradict the merit of ours.

Source: Weather Underground terrorist Bill Ayers, from his memoir *Fugitive Days*, defending a bombing attack by the Weathermen on the Pentagon. Quoted in "Radical Chic Resurgent", by Timothy Noah, *Slate*, 8/22/2001.

Analysis

Exposition:

This fallacy involves the attempt to justify a wrong action by pointing to another wrong action. Often, the other wrong action is of the same type or committed by the accuser, in which case it is the subfallacy Tu Quoque. Attempting to justify committing a wrong on the grounds that someone else is guilty of another wrong is clearly a Red Herring, because if this form of argument were cogent, one could justify *anything*—always assuming that there is another wrong to point to, which is a very safe assumption.

Exposure:

- Why do people think that two wrongs add up to one right? This is speculation, but perhaps they are misled by the logical fact that two negations cancel out, or the similar mathematical fact that two negative numbers when multiplied produce a positive number. It is common to think of wrongs as morally "negative", but this is distinct from the logical notion of negation and the mathematical notion of negative number. Thus, the analogy between moral negatives and logico-mathematical negatives is a poor one based on equivocation on the word "negative".
- Two Wrongs Make a Right needs to be distinguished from retaliation or punishment, as it would not do to condemn these on logical grounds, though they may be morally objectionable. So, when children defend themselves by hitting or kicking another child, they may be morally to blame but not logically. If a parent spanks a child for hitting another child, this may be bad parenting, but it is not a logical mistake. Punishment, or retribution, is behavior aimed at modifying behavior, not argument.

Subfallacy: Tu Quoque

Resource:

Nicholas Capaldi, *How to Win Every Argument: An Introduction to Critical Thinking* (MJF, 1987), pp. 147-148.

Analysis of the Example:

This is a very clear example of the fallacy. The terrorists tried to justify bombing the Pentagon on the grounds that the Pentagon had unjustifiably bombed Viet Nam. The gist of the fallacy is contained in the last sentence, which claims that the wrongness of the Pentagon's actions justified a similar wrong: "Wrong + wrong = right."

Reader Response:

Alert reader Ken Smith sent in the following correction of the *National Lampoon* quote:

The quotation from National Lampoon's "Deteriorata" that you list on your page is incorrect. The word "lefts" does not appear in the text at all. As spoken by Norman Rose on the album, which I have in front of me and playing, the words go:

Consider that two wrongs never make a right, but that three *do*.

I've seen this misrepresentation in other places on the web; it must have been made by people who have never actually heard the recording (considering its scarcity on vinyl, and that it has not been issued on CD.).

It's a shame, because the "lefts" version is more clever. Also, it puns on two meanings of "right", which is an example of a funny equivocation. Thanks to Ken, though, for the correction.

Undistributed Middle Term

Alias: Undistributed Middle

Type: Syllogistic Fallacy

Form:

Any form of categorical syllogism in which the middle term is not distributed at least once.

Example:

[O]ne patient…concluded that there are money-trees because "money is green [in the United States] and so are trees, so money must grow on trees."

Context of the Example

Counter-Example:

The 29 students in Mr Strang's classroom gravely considered the two sentences scrawled across the freshly washed blackboard:

All A's are C's.

All B's are C's.

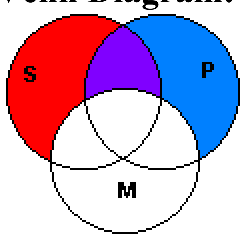
"The apparent conclusion—that all A's are B's—does have a certain allure, a kind of appealing logic."

Mr Strang blinked myopically, his wrinkled face resembling that of a good-natured troll. Then he whirled, and his chalk drew a large screeching X through both sentences.

"Of course," he snapped, "it's also dead wrong. Its error can easily be verified by substituting 'teenager' for A, 'ostrich' for B, and 'two-legged' for C in the original premises. Thus, all teenagers are two-legged, all ostriches are two-legged, and therefore all teenagers are ostriches. I doubt you'd accept that conclusion."

Source: William Brittain, "Mr Strang Accepts a Challenge", from *The Mammoth Book of Locked-Room Mysteries and Impossible Crimes*, pp. 349-50.

Venn Diagram:



Both the **Example** and **Counter-Example** are represented by this diagram, where "**S**" represents the subject term, "**P**" is the predicate term, and "**M**" the middle term. Notice that the diagram does not show that the conclusion, "All **S** is **P**", is true.

Syllogistic Rule Violated:

In a valid categorical syllogism, the middle term is distributed in at least one of its occurrences.

Exposure:

Undistributed Middle is one of the most famous fallacies, and is sometimes used as a synonym for "fallacious argument", that is, some people know that an undistributed middle is somehow logically bad, and mistakenly think that any bad argument must have one. In other words, they seem to reason as follows:

All arguments with undistributed middle terms are bad arguments.

This is a bad argument.

Therefore, this argument has an undistributed middle.

This argument *is* a bad argument because it has an undistributed middle term, namely, "bad arguments"!

Resource:

Irving Copi & Carl Cohen, *Introduction to Logic (Tenth Edition)* (Prentice Hall, 1998), pp. 275-276.

Context of the Example:

[A] major component of reasoning takes place in a frontal module of the brain, a module being a specialized, relatively independent group of inter-connected nerve cells performing a particular category of tasks. Patients who have an injury confined to this module…have a…specific syndrome in which reason is disturbed without a generalized disorder of cognition.

Appropriately enough, this isolated impairment of the module for reason is called "the dysexecutive syndrome," a condition analogous to selective disorders of language (the aphasias) or memory (the amnesias).

Patients with the dysexecutive syndrome…make mistakes in assembling rational sequences of thought. For example, one patient with the dysexecutive syndrome concluded that there are money-trees because "money is green [in the United States] and so are trees, so money must grow on trees."

Source: Donald B. Calne, *Within Reason: Rationality and Human Behavior*, Pantheon, 1999, pp. 15-16.

Vagueness

Type: Informal Fallacy

Quote-Unquote:

All things…swim in continua.

(Charles Sanders Peirce)

Exposition:

Vagueness is a characteristic of language, specifically of those terms which classify or qualify objects, that is, common nouns and adjectives. Such terms divide the world of objects into those the term applies to—the extension of the term—and those to which it doesn't. For example, the common noun "elephant" divides the world into elephants and non-elephants.

What characterizes a vague term is the existence of borderline cases which do not clearly belong or not belong to its extension. For example, consider the familiar concept of "chair": some things are clearly chairs—what you're sitting on right now, for instance—and others are clearly not—for instance, an elephant even though you might sit upon one. But there are many borderline cases: barstools, beanbag "chairs", school desks, etc.

Vagueness is to be distinguished from ambiguity, though rather fittingly the distinction is vague! An ambiguous term is one with more than one meaning, whereas vagueness is characteristic of a single meaning that has borderline cases. However, it is not unusual for a term to be both ambiguous and vague; in fact, this is the usual case.

Vagueness is a pervasive characteristic of language, and there is no reason to think that it can or should be eliminated. This is because many things in the world that we wish to distinguish lie upon qualitative scales. The color spectrum is a good example of this, and we definitely wish to distinguish colors such as orange and yellow, even though the difference between them is one of wavelength.

Moreover, the fallacy of Vagueness occurs only when the appearance of soundness in an argument depends upon vagueness in its terms. The mere fact of vagueness is not sufficient to justify an accusation of fallacy, but it is sometimes a boobytrap which can cause the unsuspecting person to fall into fallacious reasoning. For this reason, it is useful to be aware of and on our guard against vague terms, so that we can continue to use our vague language without being ensnared by it.

Subfallacies:

- Fake Precision
- Slippery Slope

Source:

S. Morris Engel. *With Good Reason: An Introduction to Informal Fallacies (Fifth Edition)* (St. Martin's, 1994), pp. 63-65.

Wishful Thinking



Types:

- Appeal to Consequences
- Emotional Appeal

Form:

I want **P** to be true.
Therefore, **P** is true.

Example:

I was attending a spiritualist message reading service. The guest speaker had each of us write our name and a question on a piece of paper and then fold the paper. An usher collected the folded messages in a basket which she then placed beside the speaker's lectern. The speaker, who had been blindfolded, would reach into the basket, pull out a folded message, and hold it to his forehead. After a dramatic pause he would call out someone's name. The named person would then stand and the speaker would provide an answer to the question. Presumably this answer was supplied by the spirits. …

… On this occasion, however, the speaker was having obvious difficulties. He was getting along in years and his eyesight was not very good. … So he pulled his blindfold away from his eyes with one hand while he blatantly opened the message with the other. After he read its contents, he refolded it, pulled his blindfold back in place, and continued with his routine.

I looked at the members of the audience to see how they would react to this obvious display of cheating. … To my surprise, not one of them was looking at the speaker. Some were gazing at the ceiling, some were staring into their laps, and others had their eyes closed. The woman sitting next to me was one of those looking at the ceiling. I nudged her and pointed to the speaker at the moment he was opening a message. She looked at me instead. I whispered for her to look at the speaker. She turned and looked at the back of the room and then turned back to me. I kept urging her to look at the speaker. She leaned back and resumed staring at the ceiling.

This bizarre behavior by the audience both puzzled and amazed me. … These people did not want to see the speaker cheating! They wanted to believe that he was providing them

communications from their departed loved ones. … They dealt with this conspicuous example of cheating by simply not looking. …
Source: Ray Hyman, "Foreword" to *The Psychic Mafia*, by M. Lamar Keene, Prometheus, 1997, pp. xiii-xv.

Exposition:

Psychologically, "wishful thinking" is believing something because of a desire—"wish"—that it be true. As a logical fallacy, Wishful Thinking is an argument whose premise expresses a desire for the conclusion to be true.

Of course, this type of thinking seldom takes the explicit form of an argument from a premise about one's belief to the conclusion that one's wish is true. Such bald wishful thinking would be patently fallacious even to the wishful thinker. Rather, wishful thinking usually takes the form of a bias towards the belief in **P**, which leads to the overestimating of the weight of evidence in favor of **P**, as well as the underestimating of the weight against. As in the case of the **Example**, it can lead to ignoring the evidence against a cherished belief, which is a case of one-sidedness.

Exposure:

Wishful thinking has been practiced under such names as "positive thinking", "optimism", "visualization", and "faith". Under these names, it has had its distinguished defenders. Defenses of wishful thinking have taken one of the following forms:

1. **Moral/Ethical Defenses:** Religious faith has frequently been claimed to be either a virtue or a duty. To believe a dogma without evidence, or even despite counter-evidence, is sometimes regarded as more admirable than to believe on good evidence. Unfortunately, this doctrine itself must be taken on faith, as there is no evidence for it!
2. **Pragmatic/Prudential Defenses:** A pragmatic or prudential defense of wishful thinking is based on the claim that one stands to gain from such belief, and that this is a sufficient reason to believe. William James' famous defense of "the will to believe"—that is, wishful thinking—is of this type. James argued that there can be pragmatic value in believing something by an act of will, when there is insufficient evidence to justify belief or disbelief. If there is pragmatic value in believing a truth, but no evidence for it, then the only way that one can gain that pragmatic value is by a "leap of faith".
   The thing to notice about the pragmatic/prudential defense is that it does not claim that the statement believed on faith will actually be true, or is even likely to be true. Rather the claim is that one can gain in some way by believing something that may be false for all that. While this may well be true, it is neither a logical nor epistemological defense of wishful thinking, unless—like James—one equates pragmatic value with truth.
   Suppose I offer a prize of a million dollars to anyone who believes that pigs have wings. There is no doubt that, if you can only force yourself to do so, you stand to gain from believing this. However, the fact that you win a million dollars in no way tends to show that pigs have wings.

The trouble with both of these defenses is that they do not show that wishful thinking is ever cogent, instead they support the following types of argument:

1. **P** is an article of faith.
   Therefore, I ought, morally, to believe **P**.
2. I stand to gain from believing **P**.
   Hence, I should, prudentially, believe **P**.

But from the conclusions of either of these arguments, it does not follow that **P** is true, or likely to be so. So, Wishful Thinking is still a fallacy, even if we accept that it is sometimes the virtuous or prudent thing to do.

Source:

T. Edward Damer, *Attacking Faulty Reasoning: A Practical Guide to Fallacy-Free Arguments (Third Edition)* (Wadsworth, 1995), pp. 96-98.

Resource:

William James, *The Will to Believe and Human Immortality* (Dover, 1985).

Glossary

This glossary defines logical terms used in the files on individual fallacies and in entries in the weblog. The first occurrence of a defined term in a file or weblog entry is linked directly to its definition below. Since most of the terms are linked from multiple files, you will need to use the "Back" button on your browser to return to where you came from.

A fortiori

Translation: "Even more so; by a stronger reason" (*Latin*).

This phrase is used when arguing that what is true of a given case because it possesses a certain attribute will certainly be true of another case which has more of the relevant attribute. For instance, suppose that Tommy is Timmy's older brother. We can argue that if Tommy is too young to see a certain movie, then *a fortiori* Timmy is too young, as well, since he is younger than Tommy.

Affirmative categorical proposition

An **A** or **I**-type categorical proposition.

Ambiguity

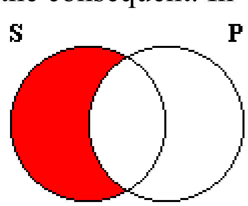
The state of having more than one meaning.

Ambiguous

Having ambiguity.

Antecedent

The propositional component of a conditional proposition whose truth is the condition for the truth of the consequent. In "if **p** then **q**", "**p**" is the antecedent.



A-type proposition

A proposition of the form: All **S** are **P**. The subject term, **S**, is distributed.

Example: All monkeys are primates.

Argument

A unit of reasoning composed of propositions.

Argument by analogy

An argument of the form:

s and **t** share the properties $\mathbf{P_1},\ldots,\mathbf{P_m}$.
s has the property $\mathbf{P_n}$.
Therefore, **t** has the property $\mathbf{P_n}$.

Barbara

Not Streisand, but the most famous form of categorical syllogism:

All **M** are **P**.
All **S** are **M**.
Therefore, all **S** are **P**.

The name "Barbara" came from a Medieval mnemonic poem for remembering validating forms of categorical syllogism, and the vowels indicate that the three propositions in this form are all A-type.

Biconditional Proposition

A proposition of the form: **p** if and only if **q**. A bi-("two")conditional proposition is equivalent to the conjunction of two conditional propositions: if **p** then **q** and if **q** then **p**.

Boobytrap

A linguistic snare which is not itself fallacious, but may cause someone to inadvertently commit a fallacy. For instance, an ambiguous or vague sentence is not in and of itself fallacious, since it is not an argument, but it may cause somebody to infer a false conclusion.

Categorical proposition

A proposition of one of the four forms: **A**, **E**, **I**, or **O**.

Categorical syllogism

A syllogism whose premisses and conclusion are categorical propositions, and which has exactly three terms.

Category

A category is a type, collection, or class of similar things.

Examples: Shoes, ships, cabbages, and kings.

Category mistake

An error of ascribing characteristics to an object which is of the wrong type, or category, of thing for that kind of characteristic.

Example: "*Pi* is lithe and slimy."

Chain of arguments

A series of arguments linked by the conclusion of each being a premiss in the next, except for the final argument in the chain.

Cogency

The characteristic of a cogent argument.

Cogent

A cogent argument is one such that if the premisses are true, then the conclusion is more likely to be true than not. Both valid and strong inductive arguments are cogent.

Commuting

Not getting to and from a job, but switching two components.

Example: Commuting "**p** and **q**" produces "**q** and **p**".

Conclusion

In an argument, the proposition for which evidence is provided.

Conditional Proposition

A proposition which asserts a condition for the truth of another proposition.

Example: If it rains, then the street will be wet.

Conjunct

One of the propositional components of a conjunction.

Example: "It's raining" is the first conjunct of "it's raining and the sun is shining."

Conjunction

A proposition of the "both…and" form.

Example: "It's both raining and the sun is shining."

Connective

A word or phrase which produces a compound sentence from simpler sentences. For example, in the compound sentence "it's raining **and** the sun is shining", "and" is a connective.

Consequent

The propositional component of a conditional proposition whose truth is conditional. In "if **p** then **q**", "**q**" is the consequent.

Contextomy

A quote which is taken out of context so as to distort the speaker or author's intended meaning. Boller & George attribute this term to Milton Mayer.

Source: Paul F. Boller, Jr. & John George, *They Never Said It: A Book of Fake Quotes, Misquotes, & Misleading Attributions* (Oxford, 1989), p. 3.

Contingent Proposition

A proposition which is neither logically true nor logically false, that is, its truth-value depends upon facts about the world.

Contradictory Propositions

Two propositions are contradictories when they must have opposite truth-values, that is, one must be true and the other false.

Example: "Napoleon was short" and "Napoleon was not short" are contradictories.

Contrary Propositions

Propositions are contraries when they cannot all be true.

Example: "Napoleon was short" and "Napoleon was tall" are contraries.

Converse of a conditional

A conditional proposition with the antecedent and consequent of another conditional proposition switched.

Example: The converse of "if today is Tuesday, then this is Belgium" is "if this is Belgium, then today is Tuesday."

Cooked-up

A cooked-up example is one created simply to be an example.

Synonym: Tame

Antonym: Raw

Counter-example

There are two types of counter-example:

1. A counter-example to a proposition: This is a true proposition which shows that a contrary proposition is false.

   Example: "John is an honest lawyer" is a counter-example to "all lawyers are dishonest".

2. A counter-example to an argument form: This is an instance of that form which has true premisses and a false conclusion, showing that the form is non-validating.

Dangling Comparative

A comparative is a phrase comparing two or more things.

Example: "Jimmy is taller than Timmy."

A *dangling* comparative is one in which one of the things being compared is missing.

Example: "Jimmy is taller."

Though context often makes it clear what things are being compared, a dangling comparative can be ambiguous and, thus, a logical boobytrap.

Deductive
Of an argument in which the logical connection between premisses and conclusion is one of necessity.

Default
Presumed until overridden by contrary evidence.

Synonym: Defeasible.

Defeasible

Synonyms: Default, presumptive, prima facie.

Disjoint
Two classes are disjoint when they have no common member.

Example: The class of apples and the class of oranges are disjoint.

Disjunct
One of the propositional components of a disjunction.

Example: "It's raining" is the first disjunct of "Either it's raining or it's snowing."

Disjunction
A proposition of the "either…or" form. A disjunction is true if one or both of its disjuncts is true; otherwise, it is false.

Example: "Either it's raining or it's snowing."

Disjunctive
Of a disjunction.

Disjunctive Syllogism
A validating form of argument with a disjunctive premiss:

Either **p** or **q**.
Not-**p**.
Therefore, **q**.

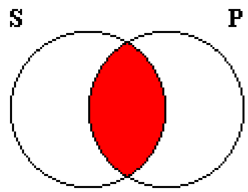
Distributed
A term in a categorical proposition is distributed if and only if the proposition implies every proposition that results from replacing the term with a more specific term.

Example: The subject term "mammals" in "all mammals are animals" is distributed because the proposition implies "all cats are animals", "all dogs are animals", "all humans

are animals", etc. In contrast, the predicate term "animals" is not distributed because the proposition doesn't imply that all mammals are cats.

Distribution
: A characteristic of terms in categorical propositions which are either distributed or undistributed.

Enthymeme
: An argument with either a suppressed premiss or a suppressed conclusion.



E-type proposition
: A proposition of the form: No **S** are **P**. Both terms are distributed.

Example: No monkeys are marsupials.

Existential Quantifier
: A quantifer which indicates that some member of a class has a property.

Examples: "Some", and "there is", are existential quantifiers in English.

Extension
: The class of things to which a term applies.

Example: The extension of the term "apple" is the class of all apples.

Fallacious
: Of a bad argument which is an instance of a fallacy.

Final conclusion
: The conclusion of the last argument in a chain of arguments, which is not a premiss in any argument of the chain.

Heuristic
: Having to do with a rule of thumb.

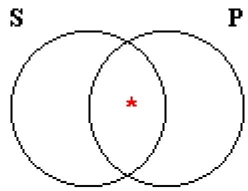
Illogicality
: Logical illiteracy; ignorance of the basic concepts and techniques of logic.

Immediate inference
: An argument with exactly one premiss.

Inductive
: Of an argument in which the logical connection between premisses and conclusion is one of probability.

Inverse of a relation
: The inverse of a relation between two things is simply the same relationship in the opposite direction. For instance, the relation of being shorter than is the inverse of the relation of being taller than; if Jack is taller than Jill, then Jill is shorter than Jack. In other

words, the relationship of height between Jack and Jill is the same, but in the first case Jack bears the relation to Jill, whereas in the second Jill bears it to Jack.



I-type proposition

A proposition of the form: Some **S** are **P**. Neither term is distributed.

Example: Some marsupials are kangaroos.

Law of Excluded Middle

The propositional form: **p** or not-**p**.

Leibniz' Law

Alias: Substitution of Identicals

A validating form of argument when "P**x**" is an extensional context:

a=b
P**a**.
Therefore, P**b**.

Logicality

Logical literacy; knowledge of the basic concepts and techniques of logic.

Logically-true

Of a proposition which is true on purely logical grounds.

Example: "Either it's raining or it's not."

Major premiss

In a categorical syllogism, the premiss which contains the major term.

Major term

In a categorical syllogism, the predicate term of the conclusion which also occurs in the major premiss.

Middle Term

In a categorical syllogism, the term which occurs in both premisses.

Minor premiss

In a categorical syllogism, the premiss which contains the minor term.

Minor term

In a categorical syllogism, the subject term of the conclusion which also occurs in the minor premiss.

Modus Ponens

A validating form of argument from propositional logic:

If **p** then **q**.
p.
Therefore, **q**.

Modus Tollens
A validating form of argument from propositional logic:

If **p** then **q**.
Not-**q**.
Therefore, not-**p**.

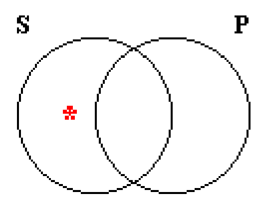
Narrow Scope
A term has narrow scope when it modifies the smallest part of a sentence that is grammatically possible.

Example: In "all the presidents of the United States are *not* female", the scope of the negation is not the whole sentence but only the predicate "are female".

Necessary condition
A condition which must be true if the proposition that it is a condition for is to be true. In other words, "**p** is a necessary condition for **q**" means "if **q** then **p**".

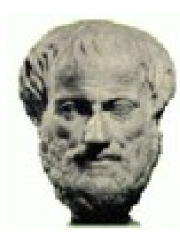
Example: "Oxygen is a necessary condition for animal life", that is, "if an animal is alive, then that animal has oxygen".

Negation
In propositional logic, a proposition which denies the truth of its component proposition.



Example: "Today is not Friday" is the negation of "today is Friday".

Negative categorical proposition
An **E** or **O**-type categorical proposition.
O-type proposition
A proposition of the form: Some **S** are not **P**. The predicate term, **P**, is distributed.



Example: Some marsupials are not koalas.

The philosopher
A medieval term for Aristotle.

Predicate Term
The term in a categorical proposition that is not the subject of the proposition, which is usually the second term occurring in the proposition.

Example: In "all cats are mammals", "mammals" is the predicate term.

Premiss
In an argument, a proposition presented as evidence for the conclusion. "Premiss" is a technical term in logic, which is frequently spelled "premise". Both are correct spellings, but I choose to follow the logician Charles Sanders Peirce in using the double-*s* spelling throughout the *Fallacy Files*. The reason for this is to avoid any ambiguity created by other uses of the word "premise". 

Source: Dagobert D. Runes (Editor), *Dictionary of Philosophy* (Littlefield, Adams, 1960).

Proposition
A sentence with a truth-value.

Propositional logic
A system of logic concerning the logical relations between atomic propositions and truth-functional compounds of them.

Quantifier
A logical constant which indicates the quantity of a class which has a property.

Examples: "All", "no", and "some", are the most frequently studied quantifiers in English.

Raw
A raw example is one that was not intended to be an example, but is taken from a source such as a periodical, book, radio or television program, or other medium.

Synonym: Wild

Antonym: Cooked-up

Regression to the Mean
The statistical phenomenon in which an extreme value of a random variable is likely to be followed by a less extreme value, that is, one closer to the mean.

Example: Suppose that a randomly-selected person is unusually tall. A second randomly-selected person is likely to be closer to average (mean) height than the first.

Rule of thumb
A rule which holds true for all normal members of a class, but admits exceptions.

Scope
A characteristic of logical terms, such as quantifiers and truth-functional connectives, but also of non-logical modifiers. The scope of a term is the part of a sentence which it modifies. In natural languages, such as English, the scope of a term is often ambiguous.

Example: The scope of the negation in the old saying "all that glitters is *not* gold" is the entire statement "all that glitters is gold".

Self-contradictory
A proposition is self-contradictory when it is necessarily false.

Example: "It is raining but it isn't raining."

Sophist
An itinerant teacher of Ancient Greece, whose subjects usually included rhetoric.

Sound
Of a valid argument whose premisses are true.

Statement
Synonym: proposition.

Statistical generalization
A proposition which asserts something of a percentage of a class. Universal generalizations are the special cases when the percentage equals 100% or 0%.

Example: 90% of birds can fly.

Subject Term
The term in a categorical proposition that is the subject of the proposition, which is usually the first term occurring in the proposition.

Example: In "all cats are mammals", "cats" is the subject term.

Subfallacy
A fallacy that is a specific form of a more general fallacy.

Sufficient condition
A condition which if true ensures that the proposition that it is a condition for is true. In other words, "**p** is a sufficient condition for **q**" means "if **p** then **q**".

Example: "Decapitation is a sufficient condition for death", that is, "if an animal is decapitated, then it will die".

Suppressed

Of a premiss or conclusion in an enthymeme which is unexpressed, typically because it is obvious.

Syllogism

An argument with two premisses.

Tame

A tame example of a fallacy is one created by a logician as an example.

Synonym: Cooked-up

Antonym: Wild

Tautology

A truth-functionally compound proposition which is true for every possible combination of truth-values of its components.

Term

A word or phrase that can be used to refer to a class of things.

Examples: Shoes, ships, cabbages, kings, tall blond men with one red shoe.

Truth-functional

A connective is truth-functional if the truth-value of a compound proposition formed with the connective is a function of the truth-values of the simpler statements from which it is constructed.

Truth-value

There are two truth-values: true and false.

Universal generalization

A proposition which asserts something of an entire class, that is a 100% or 0% statistical generalization.

Example: All whales are mammals.

Universal Quantifier

A quantifer which indicates that every member of a class has a property.

Examples: "All", "every", and "each", are universal quantifiers in English.

Vague

Of a term which has borderline cases to which it is unclear whether it applies.

Vagueness

The quality of being vague.

Valid

"Valid" is an ambiguous adjective which is used in two related senses:

1. Of arguments which are necessarily truth-preserving.
2. Of argument *forms* every instance of which are "valid" in sense 1. See "validating".

Usually context, namely, whether the subject is an argument or argument form, makes it clear which of these meanings is intended. However, sometimes this ambiguity is a *boobytrap* which leads to confusion. For this reason, in the Fallacy Files, I use "valid" only in sense 1, and "validating" for sense 2.

Validating

Of an argument form every instance of which is valid.

Wide scope

A term has wide scope when it modifies the largest part of a sentence that is grammatically possible, which is usually though not invariably the entire sentence.

Example: The negation in the old saying "all that glitters is *not* gold" has wide scope.

Alias: Broad scope

Wild

A wild example of a fallacy is one found in the natural habitat of fallacious arguments, namely, the reasoning of real people, as opposed to the exercises in a logic textbook.

Synonym: Raw

Antonym: Tame